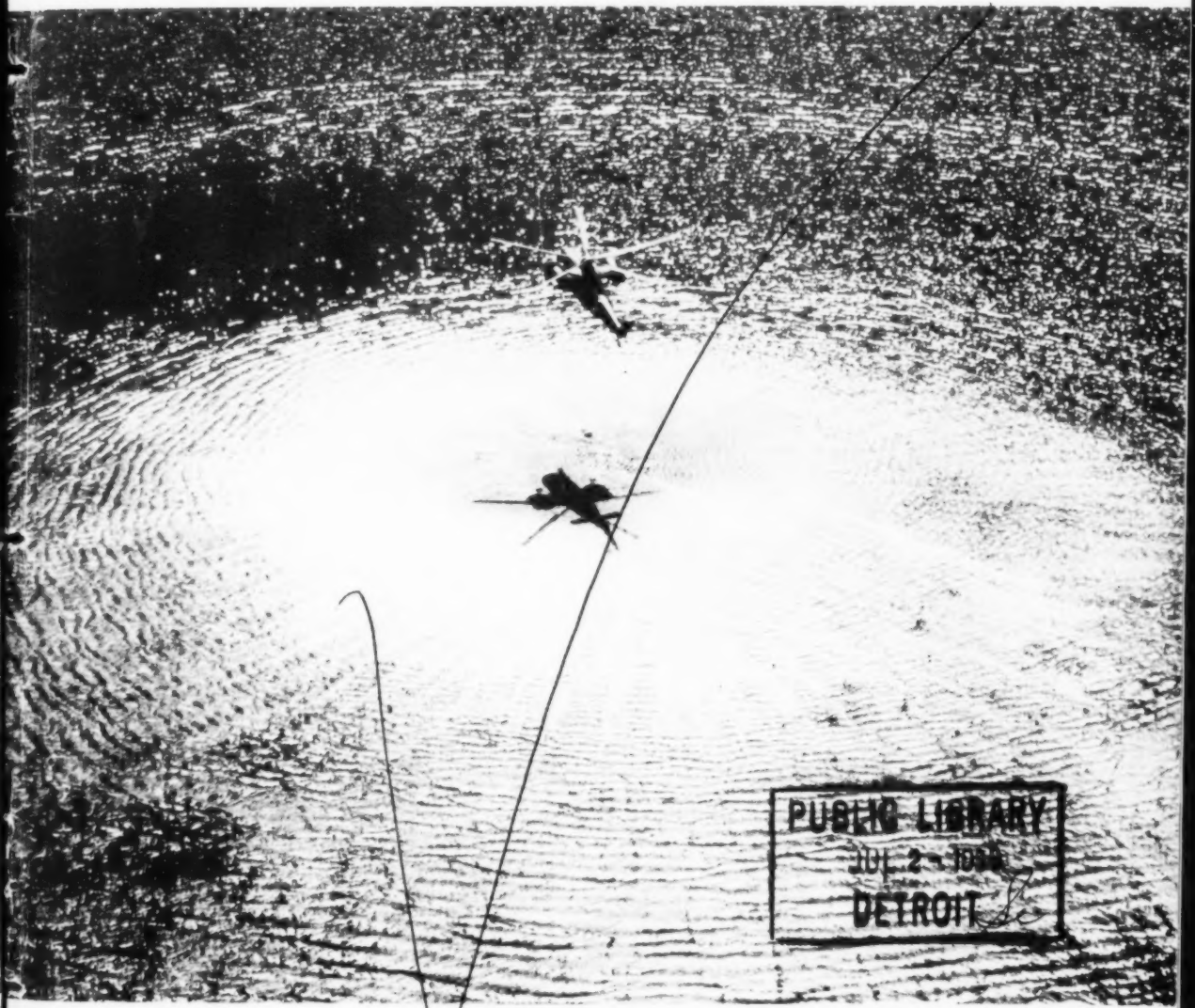
approach

NAVAER 00-75-510

THE NAVAL AVIATION SAFETY REVIEW

July 1959



It will be a long time before black boxes replace controllers — page 4

Will the versatile forklift continue to outperform the NC-5? — page 36

approach

for JULY 1959

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RADM William O. Burch, Jr.
Commander, Naval Aviation Safety Center

CDR Herman Evans, Jr.
Head, Literature Department

Editor, A. B. Young, Jr. **Managing Editor,** LCDR W. J. Thomas
Associate Editors: LCDR J. M. Wondergem; LT W. B. Kennedy; J. T. LeBarron, JOC; J. C. Kiriluk, Julia Bristow
Art Director, R. B. Trotter;
Illustrator, T. W. Healy, ALC
Production: C. A. Coe, JO2, **Photographer:** J. E. Williams, Ph 1

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COVER: HR2S being tested over Long Island Sound —courtesy of Sikorsky Aircraft.

Purposes and Policies: APPROACH is published monthly and contains the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders, or directives. Material extracted from Aircraft Accident Reports, (OpNav 3750-1), Aircraft Incident, Flight Hazard or Ground Accident Reports (3750-10), Medical Officer's Reports (OpNav 3750-8) and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Photos: Official Navy or as credited.

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Investigation Requirements

It has come to the attention of the Safety Center crash investigators that some fleet units, when faced with the unpleasant task of aircraft accident investigation, are not following sound investigative techniques.

In some instances it was noted with particular concern that adequate wreckage diagrams were not prepared prior to movement of the debris. The purpose of the wreckage diagram made at the scene is to provide ample reference for establishing a true sequence of events leading up to the accident and also to afford a guide from which a detailed, neat diagram may be prepared for enclosure with the AAR.

In preparing a wreckage diagram on the scene, it is true that all major portions of the aircraft should be indicated; however, in the case of an in-flight failure or an accident wherein wreckage covers a considerable area, attention should be directed toward those pieces which left the aircraft first, however small. The sequence of disassembly or failure will prove invaluable in establishing an accurate sequence of events leading up to the accident.

In brief, sequence of failure can best be established by studying parts farthest back along the flight path. These pieces MUST be indicated on the wreckage diagram PRIOR to movement of the wreckage.

NAVAER 00-80-T-67, Handbook for Aircraft Accident Investigators, sets forth recommended accident investigative procedures.

LETTERS

Seat Arming

Sir:

In reference to the Note from your Flight Surgeon, "Panic Reaction?", May 59 APPROACH, the statement that pulling the face curtain in the FJ-3 to jettison the canopy arms the ejection seat is correct in so far as it goes. However, to avoid any possible confusion we are interested in pointing out that jettisoning the canopy by the emergency T-handle will also pull the seat catapult pin and arm the ejection seat. If the canopy fails to operate electrically and must be jettisoned on the ground by the pilot, the recommended way is by pulling the canopy emergency T-handle in lieu of the face curtain.

NAA TECH REP

Dangerous Thing

Sir:

After reading several "Anymice" on improper reading of the altimeter and the article in the January 1959 issue, I see that the present altimeter can be a dangerous thing.

I suggest that the instrument be changed to show a numerical readout similar to an ordinary counting indicator. It should be possible to develop one with no more friction than the monster shown on pp 36-37 of the January issue.

LLOYD A. BUCHALTER,
LT, USNR–R
VP-384, NAS New York

● Your idea is partly incorporated in the new model altimeters which show the thousands of feet on a digital counter and the hundreds on the conventional circular face. There are reasons why it's inadvisable to show your altitude as a group of numbers in a window—same reason why clocks showing time in four digits never became popular. You lose "lead and lag" information, for example, and you lose the visual relationship of where you are in relation to where you want to be or should be. Many human engineering people feel that the best altimeter is the vertical red column, like a thermometer.

Power Unit Mounted

Sir:

Enclosed are photos showing modifications made to our AN MRC–(79) runway control vehicle:

We have mounted the power unit on the back of the vehicle which precludes handling of a hot, heavy unit.

We intend to mount this unit on four springs to absorb vibration. The unit can still be removed and the tail gate of the vehicle dropped.

D. S. JUDD, LCDR
NARTU, Norfolk

Clearing Turns

Sir:

Refer to "No Clearing Turns" page 2 of March 1959 APPROACH. Can it be assumed that the editor uses black type as a means of expressing the final word?

CDR Mulligan has put a good proposal in your lap but you lost it in the yarn. The clearing turn introduces greater deadly turbulence than a straight fly off as any wind tunnel test will prove.

Suggest you reconsider your answer in light of the "dozens" of clearing turn accidents that have occurred in aircraft flown by "professional" naval aviators. This anymouse has witnessed three.

ANYMOUSE

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U.S. Naval Aviation Safety Center.

● Suggest you re-read our comment (in the black type). It was our intent to emphasize the hazards and the contributing problems, but to leave the choice where it belongs — with the pilot as to time and with the skipper as to doctrine.

Language Barrier

Sir:

Re "Overboost;" page 12, APPROACH—April, 1959. Anymouse states he suffered power settling and recovered with additional power.

Power settling by traditional usage in the rotary wing field means Vortex Ring State. Had Anymouse actually experienced power settling, additional power would not have been effective until water collision had stopped the vertical descent of the helicopter. The situation described by Anymouse seems to be more one of sudden loss of translational lift in a downwind condition resulting in a high sink rate.

There is a distinct difference between "high-sinks" and stall in fixed wing aircraft; similarly, there is a difference between high sink rate, loss of translational lift and vortex ring state (power settling) in rotary wing aircraft.

Misuse of terminology is also found in AAR's. This detracts from their value both as an official report and as a safety item when circulated.

It is not unusual to find misuse of terminology on Yellow Sheets. "Ground Resonance" is becoming a catch-all phrase to describe a myriad of oscillations on the deck. One recent yaw oscillation, incorrectly described as "Ground Resonance" cost one unit 25 manhours, an additional test engagement, and another day of down time.

One answer—indoctrination of pilots in their aircraft's flight and general mechanical characteristics.

PAUL M. HINE, JR.,
LTJG, HS-2

● Safety Center analysts concur with your statements and invite attention to the article titled "Vicious Circle" published in APPROACH August 1958.

'...won't hurt a bit.'

. . . Like the dentist said to the patient, "Sure, I'm a painless dentist . . . when I pull your teeth it won't hurt me a bit!"

And so it is with the reports that will be required by OpNav Instruction 3750.6D — they are intended to be as painless as possible—at least in preparation.

A number of changes have been made to the basic instruction governing the reporting of aircraft accidents, 3750.6. Most of them are designed around one main concept—to make the submission of reports easier, more painless.

The effort of the Naval Aviation Safety Program is largely predicated upon information derived from reports. And when those reports are lacking, or incomplete, or delayed excessively, the end result is affected accordingly. No action or recommended action can be more accurate than the information from which it is derived, and it is toward more complete, more accurate information that most of the changes in 3750.6D are aimed.

Let's acknowledge right off that no commander will willfully or maliciously withhold, conceal, or falsify a report. In many cases, like major aircraft accidents, he couldn't even if he tried. But there are those situations where some tin-bending and rivets can fix a minor dent or scrape, and the job is completed with no report made. The report is looked on as unnecessary. "After all, the slight damage is fixed, no one got hurt, no new parts or materials expended —why report it? They'll only ask questions and we'll have to waste more precious training hours in filling out forms. It'll hurt our safety record too—bad for morale."

That's the prevalent attitude in many, many cases. It's a natural, human instinct to "sweep the dust under the rug" —everything looks tidy, no one is hurt or bothered, everyone's happy.

But—the dust is still under the rug. The thing that you called an "isolated case" happened at a dozen other locations last week —they all called it an "isolated case." No report made. Nothing was done. And it isn't until a few Aviation Safety Officers get together that the "isolated cases" come to light—"What, you've had one too? Why, I thought the one we had was just an isolated case."

Consider just one situation, like tire explosions, for example. A tire can explode and cause relatively little damage except to the nerves. But then one day an exploding tire did cause some damage and injury and had to be reported. A warning of the hazard was issued to all commands. And what do you suppose the reaction was? "Why, we had one like that last week! Heck no, we didn't report it—didn't do any damage except scare the livin' bejasper out of some mechs!"

There you have it — someone had to get killed or injured before a hazardous situation came to light. It's just like in auto traffic—how often have you thought, "What are they gonna do, wait until someone gets run over before they put a traffic light here?" And your answer is —they don't *know* of the hazard that you're so shook up about; no one reports the danger, the near-misses. Some day someone will get killed there, then it will be reported and they'll know about the danger. Maybe *you'll* be the one they'll hear about . . .

An occurrence that should have been reported, and wasn't, is another absent piece of information, and aviation safety suffers. Recommendations and subsequent action become more inaccurate because they are based on incomplete, inaccurate information. According to reports received, *this* appears to be the problem area—but actu-

ally, according to the reports NOT made, the real problem area is not this, but that.

Use of arresting gear is another example—from the few meager reports of *successful* use of the chain, it was mighty difficult to obtain justification for wider adoption of this vital life-saving gear. If every no-damage arrestment had been reported, there'd have been little question or doubt as to its value.

What's been done then to encourage the reporting of vital aviation safety information? Several things—simplified routing, anonymity in some instances, and the whole family of reports covered by OpNavInst 3750.6C has had to "fall out and fall in" with some reshuffling of application taking place.

The FLIGA Report is to be no more. There has been a widespread impression that FLIGA Reports counted against a unit's safety record (which was not so) and numerous FLIGAs have died while a-borning for that reason, so FLIGAs are out. Instead, the "FL" (forced landing) will be reported as a Flight Hazard. In an Aircraft Flight Hazard Report you *may* omit names and serial numbers if you wish, and the only outfit to get a copy, besides NASC, is the command's immediate senior. The "I" (Incident) that you used to report for certain specific occurrences, like bird strikes, abort gear use, or near-miss, will also be reported as a Flight Hazard Report—(the term "Incident Report," which is still retained, has another meaning now). The "GA" for Ground Accident remains unchanged from last year.

The Aircraft Incident Report will now be used to report those accidents which used to be called Minor Accidents (the ones with "D" damage) and also ones with "E" (limited) damage. There was an impression that those mishaps counted against a unit's CNO Safety Award record (which was not so), so they are now to be reported as Incidents.

A revised form, OpNav 3750.10, will be used for reporting Incidents, Flight Hazards, and Ground Accidents, merely by checking an applicable block on the form.

That leaves the big ones, the Major accidents. Since a "minor accident" is now an Incident for reporting purposes, there's no need to distinguish, and therefore a Major Aircraft Accident Report now becomes merely an Aircraft Accident Report—an AAR.

There it is, those are the major changes you'll find in OpNavInst 3750.6D. There are many minor ones, the greatest majority of them being ones of wording and explanation made necessary by the report changes already described.

There is one change that should be noted particularly though, since it affects your unit's actions at a critical time immediately following an accident. Para. 25b(5) of OpNavInst 3750.6C requires a telephone report to the Navy Department Duty Captain (Flag Plot) under certain conditions. This requirement is now changed—the call is still required, but it is to be made to the Naval Aviation Safety Center at Norfolk (MAdison 2-8211, Ext. 4331) and is to be made in *all* strike or fatal accident cases. NASC will relay the information to Flag Plot.

The objective of these changes then, is just that—to be more objective. The end purpose for all the information contained in accident reports is *more safety, fewer accidents.* Unfortunately, there's a limit to how simple the reporting of an accident can be. Ideally, it would be nice to tear off a coupon and mail it in every time you have an accident, but that'll neva hoppen. It is hoped though, that the disassociation of pilots' names from the Aircraft Flight Hazard Reports will make it simpler and less embarrassing to provide the required information. Pilots should note that *no* pilot histories are maintained on Incident or Flight Hazard Reports, and that *neither report has a bearing on the CNO safety award credits.*

Like the dentist said, it's almost painless. The only way to make accident reporting more painless is to eliminate the necessity in the first place. Just imagine how much time and manpower there'd be for field day and beer parties if *your* unit had absolutely *no* reports to make in accordance with OpNavInst 3750.6D all year! The yeoman could probably get the Zulu reports out on time every month! No sir, this won't hurt a bit . . .

Let's summarize the bundle now, and see what new reports will be required by OpNav Instruction 3750.6D.

Aircraft Accident Report
Aircraft Incident Report
Aircraft Flight Hazard Report
Aircraft Ground Accident Report


AK
0785
NAVY
102
J. O'Donnell

Even science fiction acknowledges the importance of air (or space) safety. But despite the myriad of "black boxes" that man designs to relieve his own burden, he hasn't yet designed one to think and act when the black boxes let him down. Project yourself just a bit into the future, and see what happens one day in our own century . . .

THE DAY THE AIRLINES WERE FOUR MINUTES LATE

by Lcdr. Jack O'Donnell, USNR

THE metallic voice from the console seemed to fill the small control room.

"Patina New York, this is Scandia Jet Flight Three Zero One. I request an audio read back and change in flight plan, over."

Hartnet, the duty controller turned to the flight plan monitor screen and read off the information into the microphone. "Three Zero One, this is Patina New York, flight plan follows; set course zero seven two for London, cruise altitude six three thousand, printed approach six three mike, right-hand turns, runway one three left. Touchdown time zero one five eight and one half zulu. The time now one niner five seven roger, enroute time three hours, one minute, weather and winds information on screen two, over."

The pilot repeated the instructions, then added, "I request an approach to runway one three right, if possible."

A frown creased Hartnet's lined features. "Unable to grant your request," he answered, "Lufthanza Flight Four Two Eight from Brussels is scheduled to touch down on that runway at zero one five niner. You wouldn't be clear, that's why you have been assigned the left runway, over."

"Roger, thank you," the voice sounded disappointed, "I was just trying to save taxi time. All navigation gyros are up to speed, instrument and power lights green, over."

Hartnet turned to the console and pressed a button, watched a green light come on and then said, "You're locked on the takeoff and departure control gear. Will monitor your departure on low and middle scale. Have a good trip."

While this exchange between Hartnet and the pilot had been taking place, Ralph Snead, the oncoming controller, had entered and stood by listening. Now both men turned to the left wall where a plan view of the field glowed in the semidarkness. A miniature aircraft began to move down one of the runways. They watched it become airborne, turn to a heading of 072 degrees and start

Continued from preceding page

to climb. Precisely three hours and one minute from now it would touch down on runway one three left at London Airport, guided unerringly by the integral navigation gyros in the aircraft, and landed exactly on schedule by the electronic gear in a room in London similar to this one in New York. Hartnet swung around to the control console, leaned back in his swivel chair and lit a cigaret. "Have a smoke, Ralph?" he asked, offering the pack.

"No thank you," the other answered, "smoking makes me nervous, and I guess I'm nervous enough for one evening right now."

"Nervous, what about?" Hartnet asked, eyeing the younger man.

"Well, when I walked in you were actually talking to a pilot," Ralph gave a small dry laugh, "you know as well as I do that we're forbidden to give audios except in an emergency. And I've yet to see an emergency that Dina couldn't handle. I've always considered it a waste of time talking to airplane drivers."

Hartnet started to answer, then checked himself. Snead was right, he was always losing fifteen or twenty seconds in talking to an airliner or military pilot when all he had to do was switch to automatic monitor and the machine would give the answers. He looked affectionately at the big computer. DINA, she was called, her formal name being DIGITAL INTEGRAL NAVIGATION AID. Precision flights anywhere in the world were made possible by the data stored in this computer's memory. She checked the performance figures, gross weight, fuel requirements, etc. of every aircraft requesting clearance, compared these figures with data from thousands of flights along the same routes, then combined this information with enroute traffic and weather information gathered from automatic ground and satellite stations. This data was then relayed to the PAT (for PRINTED APPROACH TAPE) station at the destination, and an electronic tape letdown plate was selected for that particular aircraft. The combined systems were known as PATINA, PRINTED APPROACH TAPE INTEGRAL NAVIGATION AID.

You can't teach an old dog new tricks, Hartnet thought. His controlling days went back to the time when the only way to get them down safe was to talk them down. When you sweated them in, your eyes straining to pick up the tiny radar target which meant that somewhere out there in the fog and rain and night a pilot and crew was depending on you to get them down safely. You felt like you'd done something, when you brought them in like that. That's why he felt a closer kinship to the boys in the cockpit than Snead did. Snead hadn't broken in until the Patina system had been established all over the world.

You couldn't blame Snead too much. He had been taught that the machine was capable of handling any situation. The public must be served, and the public expected airline operations to be on time to the second. How easy it is to forget the men who made this possible, Hartnet thought, his fingers circling the glass paperweight on his desk. Imbedded in the glass was a photograph of a smiling aviator in an old fashioned full pressure suit. The legend engraved around the edge read "Commander Kirk Conway USN, Pilot of Douglas A7D Bureau No. 205689—First Non-Stop Flight Around the World Using PATINA System—May 30, 1965." A manufacturer of one of the system's components had given them out as souvenirs after that great flight.

Hartnet put the paperweight down and pushed himself away from the console. "She's all yours, Ralph," he said, "monitor screen is set on low scale so you can see what's going on out there, automatic takeoff and land system operating and she's purring like a kitten." He got up and walked over to peer out into the night. Rain whipped against the glass in horizontal sheets. A night like this would have spelled real trouble in the old days, he thought, turning away.

He was almost to the door when it happened. The steady hum and clicking of the huge computer changed to a series of high pitched beeps. Hartnet wheeled around to the monitor screen, his eyes seeking the blinking red light that meant trouble.

Snead, at the console, had swung around also, and was already busy switching from one scale to the next. They both saw it when he switched

to high scale, a pulsing red light, indicating that a high flying aircraft was in trouble.

"Pinpoint that position," Hartnet said coolly. "I'll check Dina and find out what the trouble is."

While Snead manipulated two bearing dials, Hartnet pressed the "Identity" and "Transmit Monitor" buttons on the computer. In this way, he would get the plane's identity and all transmissions from it would be fed directly to the computer and corrective measures begun automatically. In seconds a printed tape began clicking from the machine. Hartnet seized it and read aloud, "Plane call sign Navy Rocket 310785; Type F4J 'Sundagger'; Pilot R. B. White, Lt(jg) USN; Departed USS Forrestal, Position 78 miles bearing 280 from Oahu, T.H., Destination USS Defender, Position 65 miles bearing 035 from Norfolk, Va.; routine PATINA flight plan—not holding the assigned course or altitude—no response to warning light appears navigation gear inoperative—"

"You got his position yet?" Hartnet asked with quiet urgency.

"Right now he's just south of Buffalo, at eighty-two thousand," Snead answered. "He keeps changing course so often he's hard to follow. Pilot must be unconscious or he would have called before this. Looks like we're too late to help. We'd better hit the 'Emergency Eject' button and get him out of it."

That was about all they could do now. Press the button and let Dina take over. She'd save the pilot, but not the plane. And if it hit in a populated area—

"I'm going to give him one call first," Hartnet said, grabbing the microphone before Snead could argue.

"Navy Rocket Zero Seven Eight Five, this is Patina New York, do you read me, over?"

Silence. The hum of the electric clock seemed to grow more intense as they waited. A minute went by and then Hartnet called again. Still no answer. Hartnet's hand moved across the console, broke the safety wire and lifted the red cover on the eject button.

"Station calling Zero Seven Eight Five say again your message, over."

The voice from the receiver brought the men bolt upright. Hartnet seized the mike again. "Navy Seven Eight Five, this is Patina New York, what is the nature of your emergency? We are standing by to render assistance, over."

"I didn't declare any emergency," the voice sounded irritated, "Nothing wrong up here I can't handle."

"The monitor screen holds you off course and altitude, is your navigation gear inoperative?"

"Affirmative," the voice came back, "it wasn't working properly so I turned it off."

"Did you get a malfunction light?" Hartnet asked the unseen voice.

"Negative," the irritation was back again, "the radar mapping scope showed me on course over St. Louis, but I positively identified the city as Memphis through a hole in the overcast. I know that area like the back of my hand. There is another hole to the north of my position. I expect to be oriented again in a few minutes. Will call you then, out."

The two men stared at each other in disbelief. It couldn't be true. Not in this day and age! Snead finally spoke. "Of all the stupid, idiotic things I ever heard, this is the worst!" His hand reached for the eject button. Hartnet grabbed the hand and pulled it away.

"What are you going to do?" Snead asked incredulously, "you know we can't get him down through the local traffic, and even if he turns his nav gear on again, he hasn't got enough fuel to stay airborne while Dina works out a descent from his present position. It's too late to do anything, I tell you!"

Hartnet's eyes shot from the monitor screen to the wall clock. The monitor tape showed five minutes of fuel remaining in Rocket 0785, altitude 72 thousand, descending. Suddenly his gaze stopped on the round paperweight. There was just a chance in a thousand his idea might work. 0785's voice came in again.

"Patina New York, I'm over that hole, but I don't see any lights. I guess I'm lost after all. Got any suggestions?"

"Keep him talking," Hartnet ordered, "get radio and radar bearings, vector him toward Floyd Ben-

Continued from preceding page

net Air Station, and start him down. He's clear of all traffic till he hits fifty thousand."

Hurrying to the back of the machine he hastily removed the metal cover and began to study the wiring diagrams and electric circuits of the complex computer. Beads of perspiration stood out on his forehead as he traced the wiring to the automatic monitor and transmit control boxes.

"Baby," he breathed, "we've never asked you to do anything like this before. When I give the word—please don't fail me!" Then wiring the automatic monitor to transmit control, he murmured a short prayer and returned to the console where Snead was talking to 0785.

"What's his position now, Ralph?"

"Passing through sixty thousand vectoring 205 for Floyd Bennet," Snead's voice was close to panic, "he'll never make it!"

"Keep a radio bearing on him, I'm going to shift to low scale on the monitor screen for a minute."

The low scale showed one aircraft on final in the local area, and two commencing final approaches at five and seven thousand. It was now or never.

Carefully Hartnet placed the glass paperweight on a notepad and used it to trace a circle. Then he turned to the console where the printed approach plates were stacked like records in a juke box. He waited till the aircraft on final had touched down, then quickly seized the stack of approach plates, pulled them off the rack and dropped the notepad in the slot. Into the microphone he said, "All aircraft under Patina New York control—left hand orbit—four minute circle—present altitude—this is an emergency—repeat emergency!"

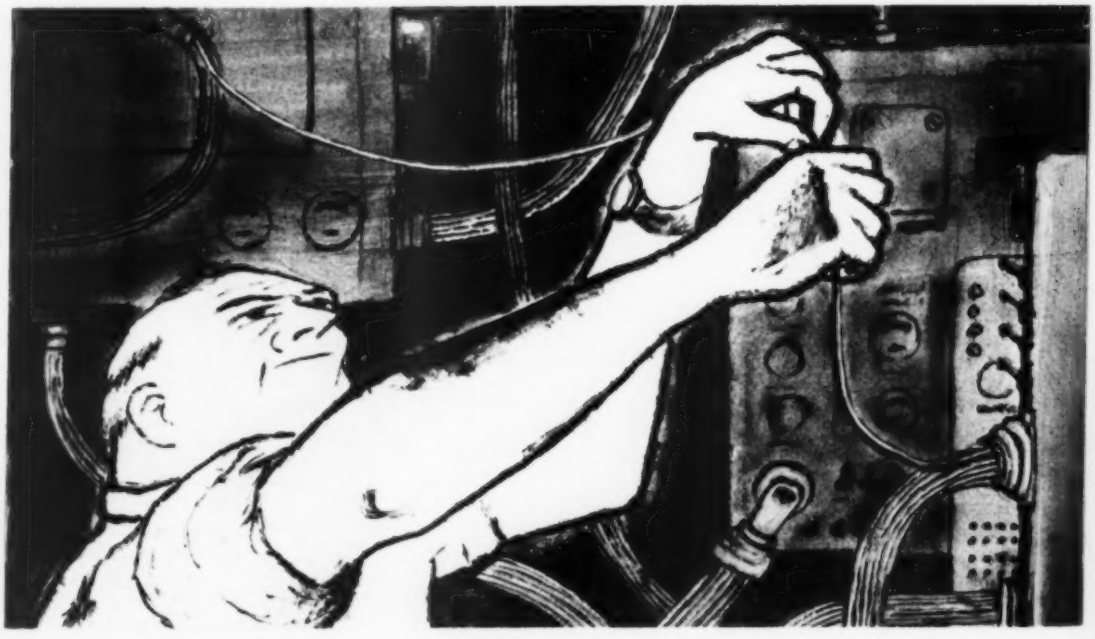
In the tiny room all hell broke loose. Dina let out a roar like a stricken lioness. Circuit breakers popped, fuses sizzled, warning bells clanged and red lights began blinking all over the console. Snead croaked a terrified "Oh my God!"

"Keep talking that plane down!" Hartnet shouted above the din. "This baby will be all right if you'll give her a minute to get over the shock."

In a matter of seconds the noise subsided. Dina settled down to a quiet, if somewhat labored grinding, and the red lights blinked out one by one. The monitor screen showed each aircraft in a precise orbit of one and a half degrees per second. The lead pencil circle on the notepad was acting as a precision pattern for all planes but one, Navy Rocket 0785. It was being controlled by radio alone.

"Switch to mid scale, Ralph, we have less than four minutes to get him down."

But Snead was beyond reacting. His eyes stared fixedly at the huge computer, his face the



color of putty. Hartnet grabbed the mike and flicked the radar screen to mid scale. The solitary dot moving in the pattern of circling aircraft was passing through fifty-six thousand.

"Navy Zero Seven Eight Five, this is Patina New York, do not attempt to acknowledge further transmissions. Imperative you answer all heading and altitude changes immediately. Am attempting to bring you down through all local traffic for a landing at NAS New York. Turn left to one niner zero, increase rate of descent to sixteen thousand feet per minute . . . "

It was like playing a living pinball machine. The moving dot of light was maneuvered around, over, and under the circling traffic. Weaving in and out like a drop of quicksilver, the light descended the scale. At twenty thousand Hartnet switched to low scale. Eighteen . . . sixteen . . . now twelve thousand went by. A wrapped up turn at eight thousand put the fighter clear of heavy traffic and at four he was clear of the last two circles. Hartnet gave instructions to reduce speed and go through the landing checkoff list, watched the dot slow down, and eased it around for a straight in approach. The moving dot passed over the threshold of the runway and the touchdown light came on. Hartnet's eyes darted to the wall clock.

Four minutes, right on the nose.

Quickly he pulled the notepad from the machine and dropped the stack of approach tape cards back in their holder. Dina resumed her normal pleasant clicking, purring sound. It was all over. He felt completely exhausted as he leaned against the console, the sudden release of tension nearly buckling his knees.

"Do you realize what you've done?"

The voice at his elbow was a whisper, breathless and shaking, like a man awakened from a terrible nightmare.

"You've put every airliner in the New York area *four minutes late!*" Snead's voice rose to a shriek. "Do you have any idea what that will cost the airlines? How many people are going to sue? It will run into billions! And it happened while I had control," the voice broke in a sob.

"I took control away from you, remember?" Hartnet said, not bothering to turn around, "You had nothing to do with what happened."

"That's right, you did take control!" Snead couldn't conceal the note of relief that replaced the whine of despair, "I wanted to press the button, but you wouldn't let me. I've told you before that you'd get in trouble talking to pilots. What would happen if we lost four minutes every time some lunkhead fouled up? And you know something? I'll bet you that kid doesn't even care what you did for him. I'll bet he's congratulating himself right now on what a hot pilot he is!"

Hartnet wasn't even listening now. Why had he taken the chance he did? He had placed a lot of lives in jeopardy, which still hadn't occurred to Snead, but would certainly not escape the attention of the investigators. Had he done it to gain back the feeling of accomplishment long unfelt? Was it a genuine concern for that one pilot that prompted him to take the risk which could have meant disaster. And which had cost him his job. No use kidding himself about that, he was through. Was he, after all, a misfit, trying to prove that individual thought still had a place in the age of the machine?

One thing he was proud of. He had proven that the computer could take a lot of punishment in stride. Dina was rugged, good men had seen to that. This, he realized, was the only justification he could offer. A court of inquiry would carve that reasoning to ribbons.

Snead's voice again brought him back to the present. "The airlines people and the investigators will be here any minute," he was saying, "and I'm going to have to tell them the truth about what happened, and I'm sure you understand I can't tell them something that was a lie and which they

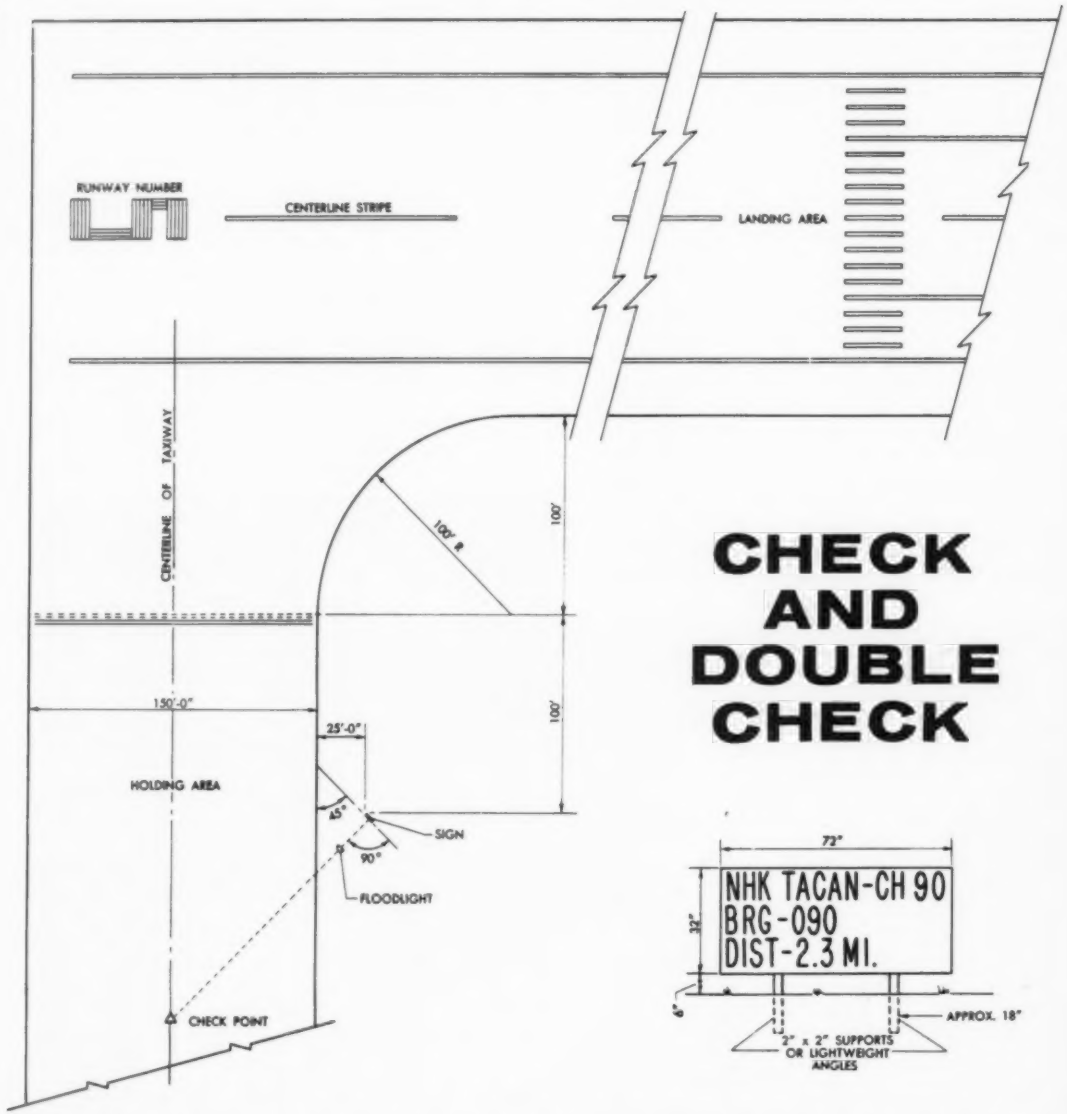
would undoubtedly find out about and not do either of us any good . . . "

"No, Ralph, you couldn't do that. They'll probably have me come in early tomorrow morning on this, so I'd better be going." Hartnet stood up and walked toward the door.

Snead started to say something else, but the door had already closed, so he stood there, listening to the heavy footsteps descend the stairs of the tower. When they had faded out he hurried over to the desk and began to write his report. ●

LCDR Jack O'Donnell, author and illustrator of this look into the future, is currently winding up a tour as the FORRESTAL'S *aircraft maintenance officer. This month he'll be reporting to FASRon Five at Oceana as executive officer. LCDR O'Donnell also flew* Banjos *with the "Red Rippers" of VF-11 and completed three years instructing in the Naval Air Advanced Training Command, logging more than 1000 hours in the* T-bird.

Just how accurate is the bearing azimuth indication of the omni or tacan receiver in that bird you're going to drive down the airways centerline today? Apparently many aviators are not fully aware of the facilities and the requirements for checking this all-important nav aid.



Until such time as more of our major air stations have provisions for ground checking of omni and tacan gear, as illustrated in the forthcoming NavAer 00-100.505 excerpt above, pilots and maintenance men must utilize all available flight and bench checking procedures to assure accuracy vital to instrument flight navigation.

MOST aviators seem to believe that the omni or tacan is working properly and accurately if three general conditions exist.

Assuming the set is properly tuned to an operating station, these checks are the disappearance of the alarm flag (and it's remaining so), a positive TO or FROM reading in that window, and a relatively steady reading of the double-barreled pointer of the RMI.

This is not always the case. Very recently, an instance of a 60-degree error in an otherwise normal instrument was reported to APPROACH. So, your omni can be working up a storm, and be giving you an inaccurate indication of bearing TO or FROM the station.

Obviously before leaping off, dirty weather or no, you want to know if it's within tolerances. In dirty weather, there's another good reason—part 43 of CAR regs requires, among other things, that certain VOR equipment checks be made prior to IFR flight.

How do you do this? Three ways are provided — ground checkpoints, airborne checkpoints, and radiated test signals at some nine major U. S. air terminals.

Where do you find out about these facilities? Enroute charts? Terminal charts? No, neither one. They are in the Flight Planning Document. (They are also included, and in more detail, in the FAA Airman's Guide, and FAA Flight Information Manual, which most NAS ops have, and which are possibly good professional tools for the squadron fund to subscribe to for the readyroom.)

It is believed that most Navy pilots will be using airborne and radiated test signal checks until more NAS ground facilities are installed. In this connection BuAer has just prepared full specs and details for ground checkpoint signs and installations. These plans are to be published in NavAer 00-100-505 (the successor publication to BuAer Inst 11012.1A). For the convenience of Aviation Safety Officers working with Public Works, excerpts of the appropriate instructions are being forwarded to them in *"Crossfeed" No. 8-59*, although it is believed that data contained in the illustrations at left is sufficient.

For more information on omni and tacan, aviators may wish to check the All-Weather Flight Manual (Section 19-1 thru 13), available as NavAer 00-80T-60, and APPROACH, June 1956 pages 10 through 15.

There are some 180 plus airborne government checkpoints, and slightly more ground checkpoints listed in the Flight Planning Manual, as well as the nine radiated test signal facilities. Following are excerpts from the FPM telling how the three systems are used.

"Ground and airborne checkpoints consist of certified radials that should be received at specific points on the airport surface or over specific landmarks while airborne in the immediate vicinity of the airport. Pilots are requested to contact control tower, communication station or airport manager for location details. Should an error in excess of ± 4 degrees be indicated through use of the ground check or ± 6 degrees using the airborne check, IFR flight should not be attempted without first correcting the source of error. CAUTION, no corrections other than the 'correction card' figures supplied by the manufacturer should be applied in making these VOR receiver checks.

"The radiated test signal is used by tuning the receiver to the published frequency of the test facility. With the flight path deviation indicator (FPDI) centered the omnibearing selector should read ZERO degrees with the to-from indication being FROM or the omnibearing selector should read 180 degrees with the to-from indication read TO. Should the VOR receiver be of the automatic indicating type the indication should be 180 degrees. (This is true for all airborne receivers except Mitchell which will indicate ZERO degrees.) Two means of identification are used with the VOR radiated test signal. In some cases, a continuous series of dots is used while in others a continuous 1020 cycle tone will identify the test signal. Information as to identification of an individual test signal can be obtained from the local control tower.

"Errors observed which are within the prescribed limits should be considered as applicable only to the bearing and transmitter checked and as a check that the receiver is properly operating. A zero error should be assumed when flying other bearings and transmitters and no compensation made for the observed error."

A recommendation for further provisions for OMNI/TACAN ground and flight checking facilities has been forwarded by NASC to appropriate authorities. It is also understood that ground equipment for "bench checking" indicators in the aircraft are being evaluated. In the meantime, maximum utilization of any nearby flight checking facilities, and proper ground checking procedures and inspections will help avoid the possibility of dangerous navigational errors. ●

monitor

Tell 'Em

Weather briefings over the phone for cross-country flights were mentioned and it was noted that sometimes the forecaster did not know that such briefings were for flight purposes. It was recommended that all pilots inform the forecaster when requested weather is for flight purposes so that enroute weather will be properly indicated.—*3rd MAW*

Alternate Communications

A UHF set installed in the tower to be used to assist pilots in an emergency situation was deemed very desirable. It is presently difficult to discuss emergency procedures with the pilot because of the high volume of traffic on the Navy primary and secondary frequencies. This is particularly desirable during the busy weekend period.—*Accident Prevention Committee, NAS, Willow Grove*

Nylon Fire Hazard

Socks are an important item. Nylon socks should never be worn as the fire injury hazard increases when nylon is worn next to the skin. Nylon underwear are likewise a hazard of this type. Fire will go up the flight suit leg and injury will be greater. Nylon G-suits are also a serious fire injury potentially when worn next to the skin without a flight suit over them.—*CNABaTra*

Maintenance Malpractices

ComNavAirPac Material Division gave a presentation on material failures and maintenance performance as they affect the accident rate. The five main points covered were as follows:

a. Selection of maintenance officer—If he has no maintenance background, he must get guidance and support from CO. (A Maintenance Officer's Guide is to be published in the near future.)

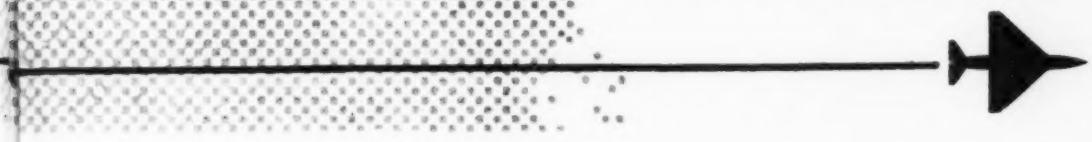
b. General condition of aircraft—In general dirty. Not suitable for flight. Steady deterioration from outside in. This condition affects unit pride.

c. Ability to maintain aircraft—Talent level is dropping. This should be considered in scheduling, as Maintenance Department capabilities are being exceeded.

d. Transfer of aircraft from one squadron to another—Aircraft transferred are not up to par.

e. Maintenance Malpractice—COs must do something about malpractices. Ground and Flight Safety Officers should constantly monitor maintenance work to pick up any malpractices. COs and XOs should get around to meet the men more often as their show of interest will stimulate better maintenance work.—*ComNavAirPac, ComNABs 11ND*

EXCERPTS FROM SOME OF THE NAVY'S SAFETY COUNCILS THROUGHOUT THE WORLD, WHO PROVIDE LOCAL LEADERSHIP AND EMPHASIS TO THE NAVAL AVIATION SAFETY PROGRAM.



Medical Preparedness

The Medical Committee reported that there is now a corpsman in the duty crash boat and that at all times there is an ambulance standing by on the field. It has been determined that in all deferred emergencies the hospital will be notified by telephone. In all actual emergencies the crash warning will immediately notify the hospital. There is a Flight Surgeon on duty at the station hospital 24 hours a day.—*ComFAirWing Six*

Pre-Accident Planning

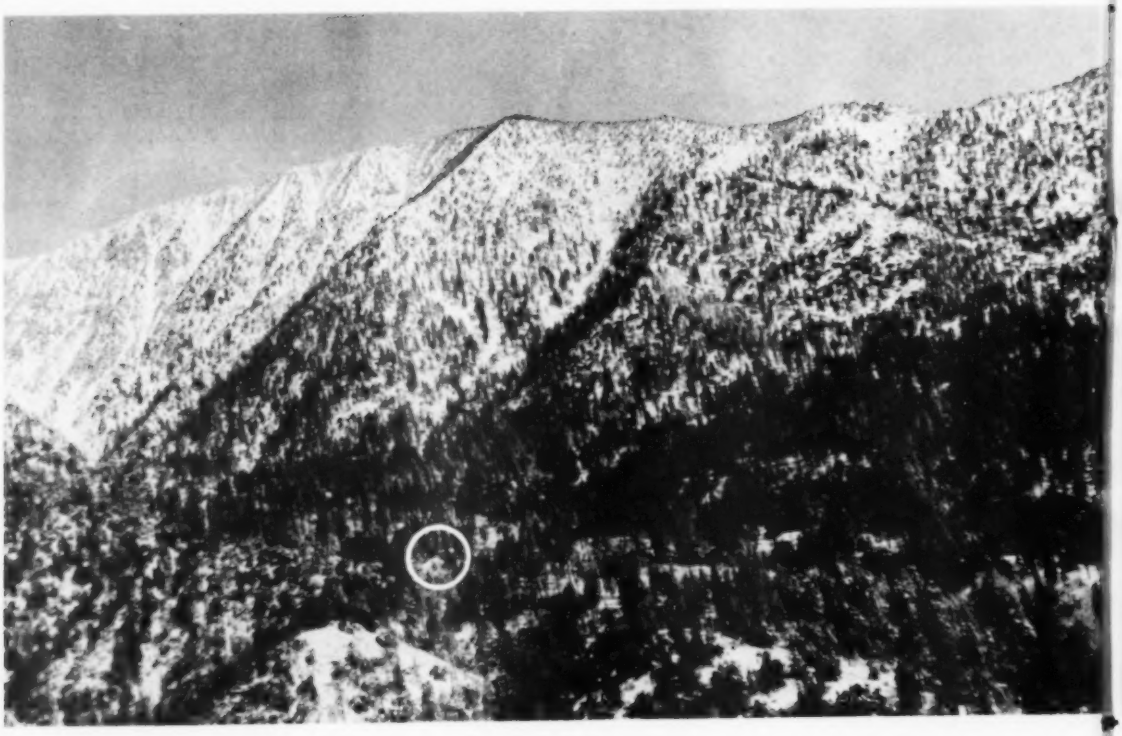
A "pre-accident planning" project will be undertaken by all M..intenance and Aviation Safety Officers. Using the guide set forth in Chapter 4 of the "Accident Investigator's Manual," each squadron will prepare a folder of action to be used by the Squadron Duty Officer in the event of a ground accident or incident. This will set forth the immediate action to be taken and will eliminate further damage to aircraft by hasty action in cases of a ground accident or incident.—*Accident Prevention Committee, NAS, NY* (see "Strikes and Spares," page 30, June APPROACH and the "Investigation Requirements," inside front cover this issue—Ed.)

Lost Hatches

Referencing a recent aircraft FLIGA, the subject of helicopter hatch loss was discussed. It was concurred by all squadrons that poor design is the primary cause. Possible clip failure also was discussed. One squadron stated that the step arrangement causes excess strain on the hatch. The main cause for concern is the possibility of the hatch coming loose in flight and being thrown through the rotors. All squadrons are conducting very careful preflight inspections of the hatches.—*San Diego Area*

Scheduled Clean Up

The "Foreign Object Damage" program was discussed. The expected goal is not being attained by individual squadron efforts. In addition, the magnetic sweeper is not being utilized as often as it should. The recommendation that all units, both Navy and Marine, conduct a simultaneous scheduled clean up was presented. It was recommended that each unit supply a specified number of personnel, and a "human chain" be formed to traverse the complete parking area. This recommendation met with the approval of all members. Liaison with other units will be initiated to inquire into the feasability of this plan.—*Accident Prevention Committee, NAS, NY.* (Please see "Proper Perspective," pp. 42, 43—Ed.)



DOWN IN THE VALLEY...

IT WAS, of all days, Friday the 13th when the helicopter headed for the mountains to search for a missing jet. It was also mid-February and the temperature was near freezing in the high altitudes of the search area.

After flying in the area a short time, Search Control called and instructed the HUS-1 to check a crashed aircraft at 10,000 feet on the southeast side of the main mountain. This wreckage turned out to be from an old accident. Next, the helicopter searched a valley on the northeast side of the mountain and spotted wreckage at about 9000 feet. A closer inspection revealed part of a yellow "X" signifying another old accident.

Following this, the pilot descended and started looking over a valley on the southeast, flying at about 6000 feet and working up the valley to an altitude of 7500 feet. The helicopter had been searching for nearly two hours by this time and then the pilot saw what appeared to be aircraft wreckage in a heavily wooded area off to the side.

After spotting and losing sight of the suspected crash the pilot made two 360-degree turns, rolled out on his original heading, established 2700 rpm and slowed the helo at about 100 to 150 feet above the tree tops to get a better view of the ground. Wind velocity was estimated as zero.

"I glanced out of the cockpit," said the pilot, "and was unable to spot the wreck and came back to the gages and noticed a motor RPM drop. I kept the collective at the same setting and added throttle which produced no effect

... At this time we were in a high rate of descent." Increased throttle and slightly decreased collective failed to regain RPM. Terrain did not permit a safe turn to the right. A left turn would have caused a further loss of rotor RPM. Going straight ahead, the helicopter continued to settle, striking the trees at a very slow forward speed and then crashing into the ground. It hit in a nearly flat attitude and rolled onto the right side. Only one man of the four was injured and he received minor injuries.

Neither the pilot nor copilot carried a survival knife and none of the personnel were wearing cold weather clothing. It was consequently very fortunate that another helicopter in the area spotted the downed crew shortly after the crash. A suitable pick-up site was located a relatively short distance away but due to the delay in "floundering" through the snow to this area only two men were airlifted back to civilization before darkness halted the operation. The two others were forced to endure a night in the mountains, aided by minimum survival gear dropped to them.

Inattention for a moment on the part of both pilots was cited as a factor in producing the accident (it was during this time that the decrease in RPM began) but there were additional items which apparently had a strong influence on the outcome. At the time of the crash the gross weight of the HUS-1 was estimated at 9760 pounds. Exact meteorological data was not available but close estimates indicate the density altitude was approximately 7500 feet at the crash site.

The flight manual gives a gross weight for hovering out of ground effect under these conditions as 11,125 pounds, and no difficulty should have been experienced. But with this in mind, these comments of the board are significant: "Pilots who are members of the board compiling this report were unable to hover their aircraft at the scene of the crash or in the vicinity at the gross weight of the crashed aircraft and under the same weather conditions."

No major discrepancies were noted on the yellow sheets prior to flight nor were any malfunctions encountered in flight. The crew chief did not notice anything unusual in the sound of the engine prior to striking the trees.

The pilot was considered by the squadron to be capable and thoroughly trained. He had the same approximate experience level (nearly 300 helicopter hours) and demonstrated the same level of proficiency in type as the majority of the aircraft commanders within the squadron. Such difference between the expected performance of the aircraft at altitude (as illustrated in the flight manual) and the true capability of the average pilot and helicopter under conditions other than ideal, as evidenced in the investigation is quite significant.

It is felt that the nature of the terrain had a bearing on the accident in that there was no horizon, only the mountain tops above and around the helo. The helicopter was operating above the sloping terrain of the valley bottom and there was a definite tendency for the pilot to determine his horizon from this incline. Under these circumstances it is probable that the pilot inadvertently assumed a higher nose position than he intended, and as a result the aircraft slowed at a greater rate than he anticipated.

Limited experience in high altitude operation also had a bearing on the pilot's attempted recovery from the settling condition preceding the crash. At higher altitudes the power output of the engine is reduced and additionally, the pilot will not experience the same response to throttle increases as he is accustomed to at sea level where a greater margin exists between power required and power available.

BAREFOOT BOY—The pilot of an F4D-1 completed one night hop then after about 40 minutes on the ground he took off again for night mirror carrier landing practice. During the period a crosswind and turbulence built up and increased reference to the instruments was needed to control airspeed and rate of descent. Dual runways were in use and lighted as was a taxiway paralleling the runways.

A normal landing was set up and the pilot took only a quick look at the lights; saw a row on either side ahead of him and landed. The touchdown did not seem out of the ordinary for a few moments then a feeling that "all was not well" began nibbling at the pilot's mind. This rapidly grew into positive knowledge that something was wrong. The rollout was a bouncing, jolting ride—definitely not the usual trip down a hard surface runway. By the time the F4D came to a stop after 4000 feet of ground roll the pilot knew what had happened. He had lined up and landed to the right of the runway *in the grass!*

While situations appearing in this section of the magazine usually involve damage to the aircraft this case is an exception. There was no damage, except perhaps to the pilot's ego, and this incident is printed as a matter of interest. "The landing was unusual," said the commanding officer of the squadron, "in that the pilot involved is one of the best in the squadron, he possesses a wealth of all-weather night experience and has ample time in model. If such an occur-

Continued from preceding page

rence could happen with this pilot at the controls, it could happen to any of us during night operations. This case reaffirms the need for pilot alertness at all times during flight."

WIND WAGON—"Although of purely academic interest at this point, this accident shows the fine line between an accident and an incident," said the squadron commanding officer. "If the pilot had not left the runway for another few hundred feet, his errors would probably have resulted in an embarrassing incident rather than a strike-damaged aircraft . . . "

The aircraft involved was an A4D. The pilot had a little over 700 hours with 150 hours in the A4D and the situation was the old familiar crosswind landing, in this case a crosswind of 50 degrees at 14 knots velocity with gusts to 21 knots. During the pilot's transition to the aircraft he had made successful crosswind landings with crosswind components as high as 20 knots.

Flaps were left down during a crosswind landing when the pilot hoped to expedite deceleration.

For several days prior to the accident the squadron had operated with crosswinds as strong or stronger than those encountered at the time of the accident, thus through briefings and actual flight experience, all squadron pilots were given opportunity to be aware of the proper crosswind landing techniques for the A4D.

On this particular day the pilot was wingman on a low altitude bombing hop and upon returning to the field the flight leader noted the crosswind was bad but he made a normal rollout without incident. "It required full throw of controls to keep the wing down," he said.

The wingman lined up on the extreme right of the runway due to the right crosswind with a safe landing interval on the lead aircraft. "I passed over the fence," he said, "lined straight down the duty at 120 knots IAS. Touchdown was made about 600 feet from the approach end and I cut power and dropped speed brakes. *I did not retract the flaps in hopes of expediting deceleration* (italics supplied). The entire rollout was effected with full right, forward aileron and brakes.

"After about 1000 feet of roll the right wing was picked up by gusts and I began a gradual arcing to the left side."

In spite of the attempt to hold the wing down with aileron the aircraft remained out of control and ran off the left side of the runway 4000 feet from the approach end. The nose gear dug into an area of soft dirt on the shoulder then struck the lip of a taxiway shearing the nose wheel and collapsing the strut. Within a matter of seconds fire engulfed the left side of the aircraft, resulting in strike damage. The pilot escaped with minor burns.

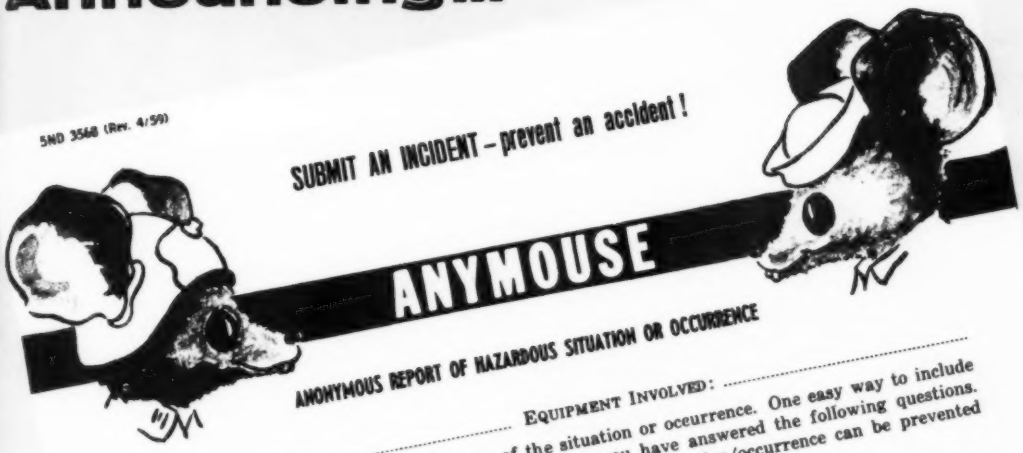
It was the opinion of the board that neglecting to raise the flaps was the most important contributing factor to the accident. With the excessive lift created by the flaps being extended, once the wing was picked up by the wind the condition was aggravated to the extent that the pilot was unable to control the aircraft. Had the pilot retracted the flaps as recommended by the Manual and squadron SOP, it was believed that the wind was not severe enough to render the aircraft uncontrollable.

DON'T PUT OFF 'TILL TOMORROW—Attempting to roll out of a bank, the S2F pilot found the wheel stuck; autopilot was OFF, and trim was ineffective. After applying considerably more force, aileron control was regained and an uneventful, straight-in landing was made. Cause: "A gallon can of emergency hydraulic fluid, located on the floor behind No. 3 operator's seat, broke loose from its securing wire and was binding against the lower aileron bellcrank." The additional force on the yoke dented the can enough to free the controls. The command recommended that gallon cans of hydraulic fluid be removed and replaced with four quart-size containers which could be stored in the step.

Same command, same model aircraft—one day later—only the BuNo and names are changed: After completing a touch-and-go landing a generator warning light came ON and smoke and sparks were noted behind the No. 3 operator's seat. Yep — you guessed it—a gallon of you-know-what located on the floor behind No. 3 operator's seat broke loose from its securing wire. This time it came in contact with the DC voltage regulator; the shorting and arcing burned a hole in the can and fluid was leaking out. The recommendation: Gallon cans of hydraulic fluid be removed and replaced with four quart-size containers which could be stored in the step.

A

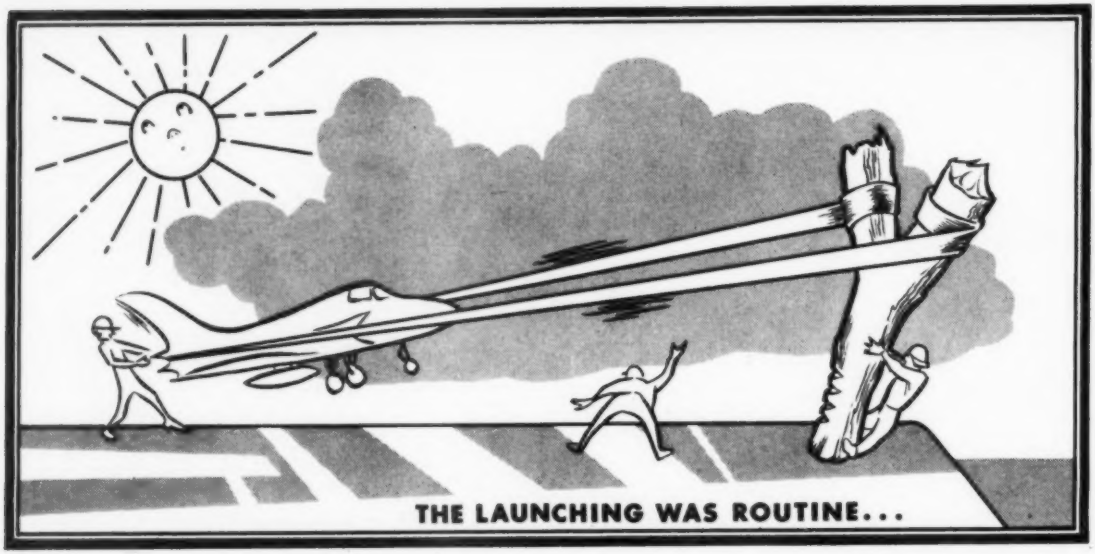
Announcing...



Here 'tis — the new Anymouse Report form! Notice that Any wears a white hat as well as a hardhat, for ground personnel can "Submit An Incident-Prevent An Accident" just as well as aviators. If you've experienced a hazardous situation, grab a form and write it up NOW. If you can suggest a solution or remedy, by all means do so, but don't hold back just because you haven't got the answer — maybe someone else does!

This form can be used to submit any constructive item affecting aviation safety, including equipment, design, Murphy's Law, supply or other associated aviation support matters. Reports may be signed or remain anonymous. The identity of the writer will be withheld if so requested.

Begin ANYMOUSE stories on next page



THE LAUNCHING WAS ROUTINE...

Bermuda Shorts

IT ALL started one lazy Saturday afternoon as a "routine" flight off a carrier enroute to the Mediterranean. The mission called for four F4D aircraft on a tacan/CCA hop. The flight leader had many jet hours and a lot of instrument time. Myself as the No. 2 man a product of the RAG program with about 300 hours in type and with enough instrument time to snicker at the *Demon* drivers. In the second section was an all-around experienced pilot, a lieutenant, well qualified for any job asked of him. For his wingman, a Lt(jg) who, on his second tour with the F4D, can do some boasting himself.

The briefing was complete with everyone familiar with what they were supposed to do. Over the teletype came the usual information. Steer to nearest field. Kindley AFB, Bermuda, bearing 120°/200 miles, tower frequency, tacan, weather, temperature, PIM, etc.. Satisfied that there were no further questions we sat to wait for our aircraft spot on flight deck and the word from air-ops for "Pilots, man your planes." Weather at the ship—9000 broken, 15,000 overcast, visibility 10 miles and forecast to remain about the same. No sweat! A good chance to get back our sea legs and start in on some serious carrier flying after a three weeks rest ashore.

Takeoff went without incident and the flight rendezvoused and proceeded up through the overcast in parade formation to the marshalling point to begin their mission. During this time the No. 4 man took the lead of the second section since the third man's tacan was out. He would then make a section penetration on the now No. 3 man's wing.

After holding for about 15 to 20 minutes, I crossed over to a starboard echelon and we turned outbound for breakup. The flight leader "kissed off" and with 30-second intervals the rest of the flight broke

The purpose of Anymouse Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in readyrooms and line shacks. All reports are considered for appropriate action.

— SUBMIT AN INCIDENT, PREVENT AN ACCIDENT —

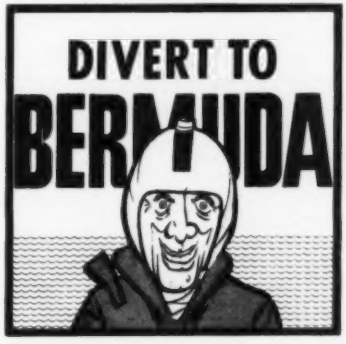
giving one-minute separation in the penetration. After I reported "down" with side number and fuel state I locked on to the flight leader using radar as a further precaution for separation. This is when the ship's approach control called and advised us to ". . . break off the penetration, climb back to the marshalling point and conserve fuel." The second section had not reached the pushover point yet and waited for the first section to join at the marshalling point. Approach control advised us at this time that the ship had a steering casualty.

Periodic fuel states were given and after holding at marshal we were told to procede to Kindley AFB with bearing and distance given. At this I was overjoyed, never having been to Bermuda before, and promptly cranked in Kindley tacan. Darn! I knew I should have put that five dollars in my flight suit. Oh well, maybe someone else brought some "diversion" money.

The tacan needle started to spin and settled on 120 degrees and the DME read 159 miles. The leader still continued in a port orbit at marshaling point and asked if we were cleared to depart for Bermuda. During this time the other seven jets airborne from our ship were given instructicns to depart for Bermuda on 121 degrees magnetic. Two A4Ds and a photo *Cougar* were also on our frequency and they asked for the latest Bermuda weather. The familiar "wait one" was given by the ship, but shortly they came up with ". . . the latest Bermuda weather is . . . "

Our flight leader still trying to get confirmation to depart for Bermuda cut in on the weather report and asked if he was cleared to go there. After this the No. 3 man in our flight came up and advised the flight leader he cut out the ships report on the Bermuda weather. One of the other A4D pilots was experiencing radio difficulty at this time so his wingman repeated the weather for his benefit and knowingly for ours. The weather at Bermuda—600 scattered, 1400 scattered, 5000 overcast, visibility 7 miles with light rain showers and lowering. Still no sweat, plenty of fuel and what's a little weather like that to a group of "professional" all-weather pilots.

The flight proceeded to Bermuda at 18,000 feet well above the overcast. Our flight leader then came up and told the flight to switch to our squadron common frequency. After checking in with the leader we advised him of our fuel states. The fourth man suggested he monitor one of the ship's frequencies and report to us any further instructions or changes. The leader said all right so periodically the No. 4 man came up on our frequency passing on any information from



the ship. His tacan still inoperative, he was given our bearing and distance from Bermuda.

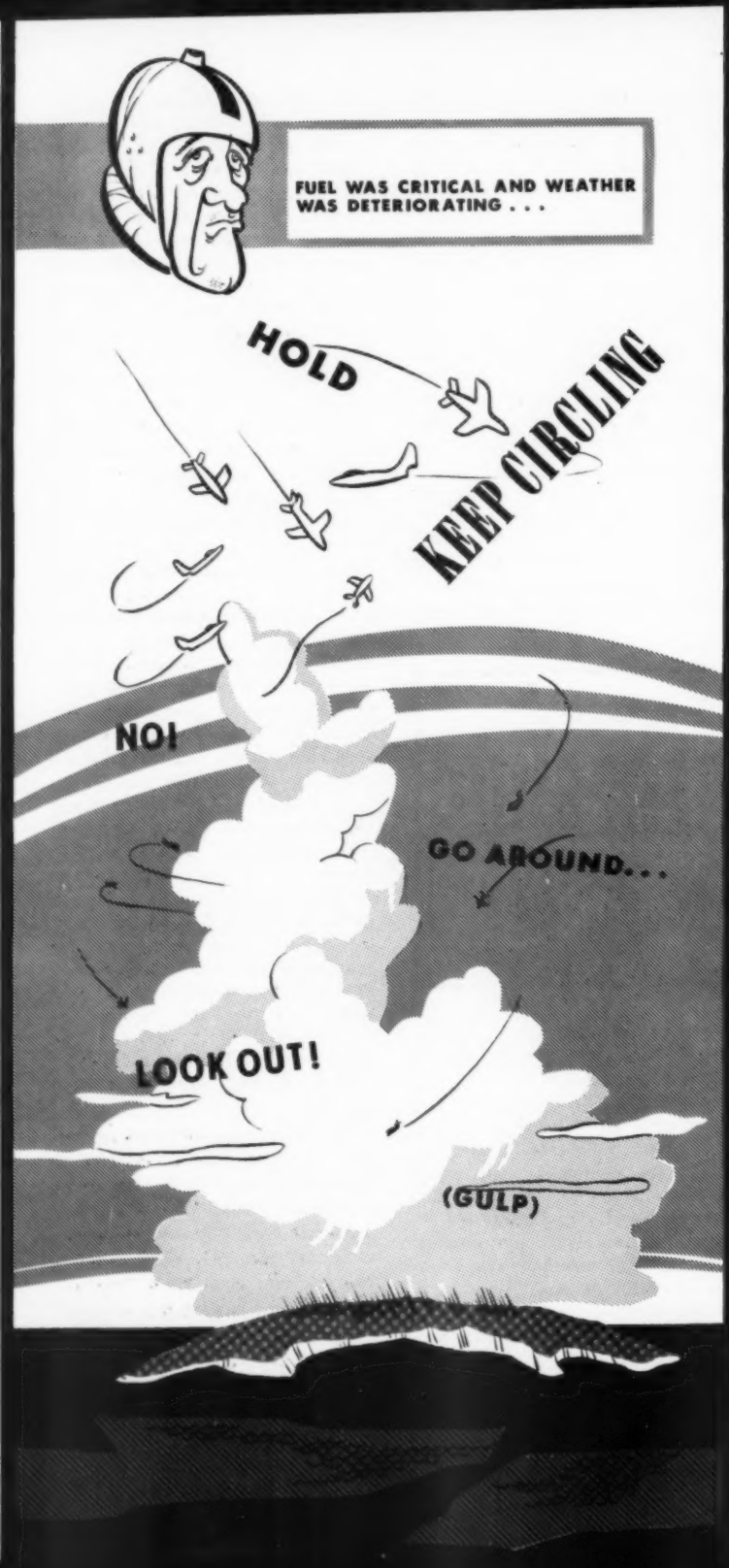
About a hundred miles out new Bermuda weather was given via No. 4 man as 600 scattered, measured 1400 broken, 5000 overcast, visibility 3 miles in light rain showers and fog and suggested the flight leader try and contact Kindley. The weather was lowering but still "no sweat," making a penetration and GCA to a strange field without an approach plate may be interesting.

The flight leader told us to stand by our squadron common frequency, he was going to contact Kindley tower. For the benefit of the fourth man, the bearing and distance was repeated 121 degrees, 80 miles. Many minutes and miles later still no word from our flight leader. We were now almost over the tacan station. What was the trouble? What kind of penetration were we to make and what was the latest altimeter setting, latest weather and many more questions kept running through my mind. At this the flight leader told us all to switch to Kindley approach control frequency which he gave us.

The flight checked in and the flight leader proceeded to give us the pertinent information, all this being done while approach control was trying to penetrate aircraft and provide separation for "Blue" flights departing. The weather was reported as a measured 600 overcast, 3 miles in light rain and fog and now our fuel was getting low. My heart gave a few extra pumps when approach control kept telling us to "stand by" for an approach time. They too had their hands full since two-minute separation was needed between aircraft in order to avoid saturating GCA. ". . . Do you have an approach time for me?" Our leader tried again with the same negative results. Fuel was now reaching a critical point and weather deteriorating rapidly. The latest special on the weather was measured 600 broken, 1500 overcast, a mile and a half in light rain and fog.

Now everyone was becoming concerned and *my heart came up in my throat when 20 F–100s called 10 minutes out with word they had missed their in-flight refueling and requested instructions for penetration. What began as a "routine" hop now was turning into an emergency!*

Again the flight leader asked for



an approach time and stated we would provide for our own separation, making section penetrations due to low fuel states. At last, after what seemed like hours of waiting, we were given an approach time and the first section pushed over.

Weather now partial obscuration measured 600 overcast 3 miles in light rain and fog. After being airborne for two hours the fuel reached a critical point and with no alternate field to worry about it was land or log a little free falling time. Pitot heat, defrost on, cabin temperature and so on as I went through the landing checklist. Due to the low fuel we made the penetration without speedbrakes.

Down into the soup we dropped and approach control switched us to GCA. Since we had to dial in our frequencies I felt (to use an old cliche) like a "one armed paper hanger in a storm" trying to tune in GCA. How I picked them up I'll never know. The rain was a torrent across my canopy and I tightened in a little closer to the leader, my argus eyes sweeping from the instruments to my leader. Down, down we went and with every foot it became a little darker. My leader was now a blur through the canopy. The last 5000 feet I started to count off five, four, three, two, one, where's he going, I thought, as we leveled off at 800 feet. What was the height of the highest obstacle? I couldn't remember.

GCA now told us to switch to a final controller and back up to 1500 feet we went. Here I go again only this time I could dial in the first two digits when down came my leader's wheels. With a little pumping of throttle and speed brakes I managed to hold position and lower my landing gear. No time now to get that frequency tuned in for down we went in our glide slope—thank goodness we didn't have flaps to contend with.

Down we went again, 800, 700 and all the time slowing to landing airspeed. The last look at instru-

ments I remember seeing 140 knots descending through 500 feet. What should I do? Is he going to fly into the ground? Should I break away and then what would I do? A million questions went through my mind in a flash. How could the human brain function so fast? I wasn't getting any solutions but at least I was still thinking. Then the trouble started. At approximately 200 feet we broke out over the approach lights at the end of the runway. We were in a slight starboard turn. (I was still on the right side) and about 20 degrees off runway heading.

I must have spotted the runway the same time as the leader as he made a right turn for the runway. Great! What a position to be in! Nice and slow and low in a turn with the lead plane turning into me. I didn't have time to think—back came the power as instinctively I tried to stay with him. The leader lined up with the runway, rolled wings level and was going in for a section landing. For me I felt the bottom starting to fall out as the plane began to settle. Full RPM and burner but just a little too late. For a moment I was paralyzed waiting, not knowing whether my engine would pull me out in time or be engulfed in a holocaust of flame. It happened almost simultaneously as the plane hit down, the burner caught and I was back in the air again.

Well here you are again flying anyway I thought, as I suppressed the desire to keep the plane on the ground. The "touch-and-go" didn't feel too hard but don't take any chances. Switching to guard channel I called the tower, told them I had an emergency and that I was going to make a modified low visibility approach. Down the runway I flew for a minute, turned in 30 degrees of bank to the left, and held it until I came out on the reciprocal heading of the runway. I flew this heading for a minute and a half and again turned in 30 degrees of bank to the left thinking I should come pretty close to the runway. By this time I had completely lost sight of the field. At the 45-degree position I could see a lighthouse and asked the tower which side of the field the runway is on relative to the lighthouse. The tower replied the field is south of the light house so I turned well inside of it trying to find runway 30. Seconds later the runway became visible and I went in for a normal landing.

The flight leader during this time was parked on the starboard side of the runway having blown two main tires on touchdown. I had 9700 feet of runway. More than enough. As I touched down on the port side of the runway the slight crosswind from the left moved my plane to the right in the direction of the flight leader's aircraft. I applied left rudder, since I still had rudder control, and the nose came around. Putting speedbrakes out and switching to manual fuel control for lower RPM was a habit for me when landing on wet runways to preclude any unnecessary brake application. The plane again started for the starboard side but this time the rudder had little effect and I continued in the direction of the other plane.

Now I had to use brakes but when I pushed on them the pressure in the port brake slowly decreased to nothing. Now what? Throttle OFF, master engine switch OFF, hook DOWN and all the drag I could hope for. What a hopeless feeling being strapped in a plane and having done all you can, watch it heading for a collision.

What luck! I slid by the flight leader's plane by three feet clearance at about 30 knots—too close for me.

The plane had enough momentum left to taxi off an intersection and it came to a shuddering stop clear of the runway. I cleaned up the switches in the cockpit, climbed out and tried kicking myself. Looking for damage, I found a broken brake assembly and a blown nose tire. What a disgusting stupid feeling I had. Always before I had thought it could never happen to me but always to the next guy.

Looking back over the "scene of the crime" I wondered what would have happened had I made a section landing without difficulty and the leader swerved to right as he did on touchdown. Also the last man in the flight shut down with 400 pounds of fuel so he never would have made it had we not made section penetrations.

Now I'm back again flying off the "ole Maru" but a little more cautious and without the complacent attitude I once had.

BUTT REST

RETURNING to our Alaskan base after a 10-hour patrol in a P2V the weather was typically lousy; a reported 500 broken 2 miles in snow and rain. On GCA final the wind was directly abeam and gusting to 20 but the reassuring voice of the final controller droned on in the headset . . . "On course, on glidepath." Then the message changed. "Going above glidepath . . . and holding . . . ." Hummm, gusty. More power off, ease her down a bit.

One and a half miles from touchdown we were on course, on glidepath, and the outside observer reported visual contact. Whew, made it! Gear checked . . . props to 2600 . . . flaps . . . HEY! The props are stuck at 2200!

Easy now, don't panic. Try the synch lever again. Well, too late to fool around. Time to land this "bird." Where *is* the deck! Down a bit more than THUMP! Whew . . . runway's slick too . . . Aileron into the wind and slow down. Now let's figure out what happened to the props. What? You mean that pack of cigarets on the pedestal shut off the synch when I pulled the throttles back? Well, I'll be . . .

Needless to say we are now one thoroughly indoctrinated crew. We double-check the pedestal and make sure it's clear. ●

HEADMOUSE

Have a problem, or a question? Send it to HEADMOUSE—he'll do his best to help.

Lost Radio

Dear Headmouse:

What is the proper procedure in case of radio failure prior to reaching a short range clearance limit? Specifically, suppose a jet is cleared to a short range limit and 15,000; he had filed for 35,000 and loses radios before reaching the short range limit, no further clearance received.

Now, does he proceed to destination at 15,000? At 35,000? Or does he return to departure point and land? If he continues on, at what time does he begin descent? Let's assume he doesn't have fuel to continue all the way at 15,000 too.

This command's solution is *not* to accept a short range clearance that could put you in trouble if you lost radios—is that right?

SAFETY OFFICER

► Absolutely right. Not only should you not accept such a clearance, but FAA, by their own rules and agreements with local jet-operating commands, will not normally issue a short-range clearance without enough info to enable you to continue to destination. Flight Information Publication-Planning, Sec II, says, " . . . Military jet aircraft will not be issued a short-range clearance with an assigned altitude to the clearance limit below 20,000 feet . . . "

In the case you cited, the controllers would have to do some sharp second-guessing on how sharp you are. Legally, you would be obligated to proceed to destination at the last assigned altitude (15,000) or the MEA, whichever is higher. *If* the controller knew you couldn't make it that low, he might reason that you'd go to 35,000, but he'd only be obligated to clear 15,000/MEA for you. We don't think he or anyone would expect you to return to your departure point. We would expect you to begin descent at your ETA or later, based on your ETE for 35,000. Of course, we're assuming that your radio failure leaves you with enough nav aids to enable you to proceed to your destination; if you're completely out of radios, you're left with only the triangular pattern (which would you fly—left or right?) and your parrot to squawk. What then? Well, if you're in the clear, wait for an intercept; if you're not, it sure would be helpful to know the height of the ceiling below you and the tops above you . . .

No rule or set of rules can cover all possibilities of such situations, which is why it's important to ask yourself, "what are they *expecting* me to do next?". But the best advice is your own answer—don't accept a short-range clearance unless you absolutely last-ditch have to. If you're offered one, bear in mind it's being given to make things more convenient for yourself and for the Center, but you're *not* flying an airplane for your convenience or for theirs.

Very resp'y,
HEADMOUSE

Which Rule?

Dear Headmouse:

We were scheduled to fly an S2F from NAS Corpus to NAS Pensacola. One of Texas' famous Northers had hit the Gulf Coast just a few days prior and the weather had deteriorated over the entire flight path route.

We took our DD175 into Aerology at NGP and were given a Pensacola forecast of 400 and 2, but were informed that everything was below limits for an alternate.

Being interested in accomplishing our mission, we did a little sleuthing on our own and discovered that Eglin AFB was forecasting 600 and 2 for our ETA plus 2 hours. To us this seemed adequate, for the GCA minimums at Eglin are 200 and three-quarters, and applying the 200 and one-half from Sect. III para. 3 of OpNav Instruction 3720.2A, we came up with 400 and 1¼ as the forecast weather required at our alternate. It seemed to us that the 600 and 2 forecast for Eglin made it an acceptable alternate.

"Whoa boys," said the ODO, "you've got to have 800 and 2 before you can use Eglin as an alternate."

We replied, "OpNav Instruction 3720.2A states that we need only 200 and three-quarters above the published PAR (GCA) minimums."

"You haven't read paragraph 4a of the basic instruction" he continued, "which says, 'Except where this instruction contains more stringent requirements, Part 60, Civil Air Regulations, governs the operation of naval aircraft under instrument flight rules', and the 800 and 2 are more stringent than 400 and 1¼."

We accepted this explanation and filed for Lake Charles with Corpus as an alternate.

However, since that time we have heard conflicting interpretations of destination alternate requirements from aerologists and operations officers alike.

If CAR part 60 always takes precedence, why was the ILS/PAR minimums column for multi-piloted aircraft included in the instruction? It seems to us that it will never apply if one always is required to have 1000 and 1, or 900 and 1½, or 800 and 2 as outlined in CAR Part 60 for alternate requirements.

Could you please clear up this point for us and a number of other Naval Aviators?

D. R. YEAGER, LT, USN
A. C. FERGUSON, LT, USN
ATU-611 Corpus Christi, Texas

► You're not the only ones in doubt about the same situation; NASC also received the same question from the Training Department of ATU 601 and from CDR R. B. Williams, Jr.

Paragraph 4a of 3720.2A governs for *clearance* purposes, since the restrictions of CAR 60 are more stringent. Once you

are airborne and enroute, however, you are governed by the published minimums for your alternate — see the note at the end of CAR 60.42.

You are right in that the table in Section III of 3720.2A is always outweighed by CAR 60. The FAA has been approached on this matter and has been asked to consider the following PAR/ILS clearance requirements for alternate airports:

Multi-pilot aircraft—200 and ½ above published minimums

Single-pilot aircraft—200 and ½ above published minimums, or 400 and 1, whichever is greater.

Very resp'y
HEADMOUSE

Prime Technique

Dear Headmouse:

Re: "C'Mon Baby" in the November issue of APPROACH magazine:

. . . Several procedures set forth are not in conformance with instructions set forth in Flight Manual, Navy Model, AD-5 Airplanes, revised 1 Feb 1955 and Flight Manual, Navy Model, AD-6, AD-7 Aircraft, revised 15 July 1956.

Under ENGINE STARTING in the article, the author states, "After engaging the starter initially, watch the propeller carefully while it makes the required two revolutions. The AD-5 Flight Manual, calls for two revolutions (8 prop blades), while the AD-7 Manual requires four revolutions (16 blades). The author states that the ignition switch must be turned to *both prior* to energizing the primer. Both manuals state that the primer should be energized and the ignition switched to BOTH in that order in rapid succession.

Paragraph 3, under engine starting poses the question in the reader's mind, "Does the author advocate the use of intermittent prime?" If so, this is not in accordance with the manuals. A warning note in both of these cautions the pilot against the use of intermittent prime as this creates a fluctuation of the fuel/air ratio which in turn causes backfiring which imposes shock loads on the gear train of the supercharger and creates a serious fire hazard.

Clarification of the above subjects will be greatly appreciated.

R. P. COTTINGHAM
MARTD
Grosse Ile, Mich.

► *See answer after next letter. —Ed.*

Sir:

As an ex-AD squadron Power Plants Officer, I have logged many sleepless hours trying to understand the cranky old R-3350. Therefore I seized the November, 1958 APPROACH and greedily devoured the article by LCDR Saunders. My appreciation of the otherwise excellent work was marred by the chill feeling of horror that crept over me as I read his comments on starting. He glibly advised that pilots figure out how much prime they'll need and prime accordingly. In one fell swoop, with the aid of your wide circulation, he no doubt neutralized thousands of hours of effort by Wright Reps, the training command, and squadron maintenance people to convince pilots that they should never (repeat—never) use intermittent priming on the R-3350.

Since the primer on these engines consists, essentially, of nothing more than a valve between the carburetor body and the blower section, absolutely no metering is accomplished by intermittent priming. The technique merely provides squirts of fuel and causes the mixture reaching the cylinders to vary with time (or RPM) from too rich to too lean—and any start achieved this way is caught "on the fly" so to speak—a tailor made, pilot engineered setup for the very evils LCDR Saunders warned of in describing a too rich or too lean start.

W. T. NELSON
LTJG, USNR-R
Engineer—R & D Div.

► The following is quoted from the article: "However, you may find that there are a few items which do not apply to your particular model." With this quotation in mind, it is possible to explain what was meant by stating that the propeller should be watched carefully while it makes the required two revolutions for any evidence of stoppage or hesitation which might be caused by a piston running up against a cylinder partially full of liquid fuel. This was intended to be the minimum amount of revolutions recommended in the prevention of hydraulic lock. The various Flight Manuals, dealing with R3350 powered aircraft, recommend procedures that vary from two up to four revolutions. One known squadron has set the minimum at five revolutions.

The AD Flight Manuals are the only manuals involving the R3350 engine which have differed from the engine manufacturer's recommended procedure of turning the ignition on prior to priming during engine starting. Douglas Aircraft has stated that this recommended procedure is concurred in and that the change will be included in the earliest possible manual revision.

It was not the author's intent to advocate the use of intermittent prime during engine starting. The engine manufacturer recommends that steady prime be utilized in all engines when starting. The AD Flight Manual contains a definite warning against intermittent priming. The length of steady prime to bring an engine to a smooth RPM is directly dependent, however, upon both atmospheric and engine conditions at the initiation of the start cycle. A note in the P2V and P5M Flight Manuals call attention to these conditions. The note further states to release prime, if the engine appears to be loaded up under hot weather or engine conditions, until engine fires and then immediately reapply and hold until RPM stabilizes. Although both aircraft manufacturers did not intend this practice to mean intermittent prime, the possibility of misinterpretation may exist. Lockheed is investigating to determine if a warning note should be inserted in the Flight Manual. Martin is revising its Manual to make the starting procedure compatible with the engine manufacturer's procedures.

Very resp'y,
HEADMOUSE

GUYS AND GULLS

There is always the inherent danger of bird strikes during operation of aircraft in any locality but the possibility seems greater in coastal and waterbound areas.

SEAGULL aircraft collisions are most common along both coasts of the U. S., and have involved jets, reciprocators and helicopters. A few accidents have been reported along the coasts of Europe. Most of the accidents occur during takeoff or landing. Reports indicate the highest mid-air collision with a seagull occurred at 400 feet. Collisions have been reported occurring both day and night. Damage has ranged from damaged leading edges of wings and tail surfaces to ingestion of birds into intake ducts which resulted in engine failure and forced landings.

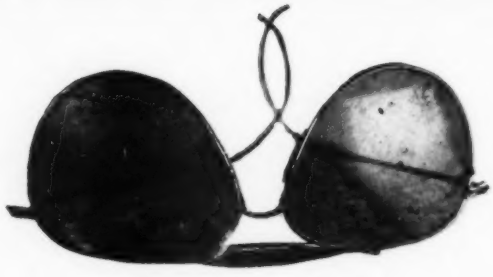
Collision with seagull incidents have evoked a number of comments, observations and recommendations. These are offered to stimulate thinking on the subject which may, perhaps, bring about a practical solution to the problem.

One command reports that "under *certain* atmospheric and seasonal conditions, seagulls congregate in rather large numbers on the runway." No further explanation was offered as to what these certain conditions were. Perhaps some ornithologist can shed some light on this aspect

Continued from preceding page

of gull behavior. To flush gulls from the runway a jeep or other vehicle is used to run down the runway prior to aircraft take-off. The birds invariably return to the runway shortly thereafter. The command is contacting wildlife authorities prior to taking more drastic, possibly lethal, measures to reduce hazardous avian concentration.

Helicopter pilots were cautioned of the danger of collision with birds at normal helicopter operating altitudes and advised to keep forward speeds consistent with visibility limitations.

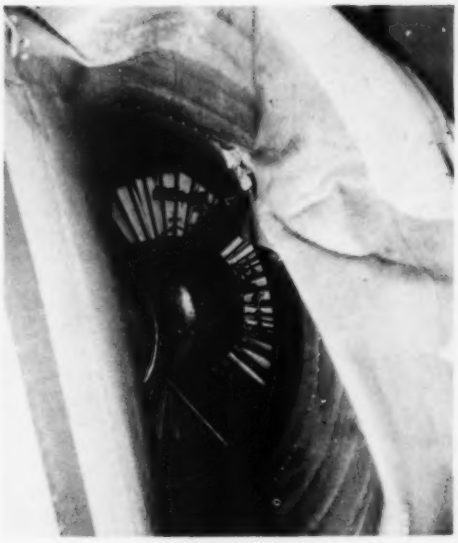


AERIAL ENGAGEMENT—Seagull strike on windshield area of P4Y (above) during low altitude bombing run shattered windshield, struck pilot in face and head, photos left and right. Pilot in right seat took over controls and flew plane back to base without further difficulty. Pilot sustained minor injuries.

One NAS took a seagull prisoner and made a tape recording of his distress call. The plan was to use the recording to frighten the rest of his flock into making a hasty departure, but all the recording accomplished was to start them sounding off with their own cries of distress. The cries did seem to frighten away other flocks, but it was later discovered that it was not the distress calls, but the odor emitted by the frightened gulls that kept the other seagulls away. Now, if a person could get enough scared seagull uh, er, excrement and sprinkle it around the runway . . .

One outfit discovered that mothballs kept some types of birds away. It isn't recommended that you scatter mothballs all over the runway, but moth crystals near the runway might have some effect without harming aircraft.—This method certainly isn't guaranteed.

The Air Force *Maintenance Review* reports of a commercial product to bird-proof hangars, etc. They say, "This material is supposed to work, and it is supposed to be easy to use." The manufacturer claims it is a harmless compound that birds find unpleasant underfoot. It is available from the National Bird Control Laboratory. If you should try this



FEATHERED FRIEND (?) During straight and level flight bird struck starboard gun bay door of TV-2, left. Bird went into A4D's engine, right, necessitating an engine change.

chemical, APPROACH would appreciate a report on the results you receive.

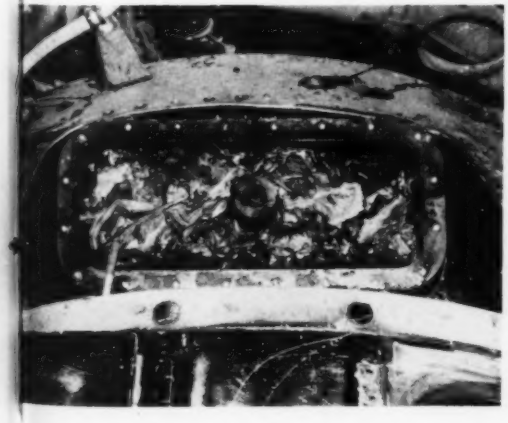
A recent Associated Press story reveals that the Army unknowingly has had the fix for over a year, but it was only recently discovered at an airfield in England. Officials experimenting with a tape recording of gulls' panic signals were disappointed when the birds fled, then came right back. But there was a recording of a teenagers' party on the same tape.

Out came the voice of Elvis. Off went the birds, and they didn't come back for 24 hours.

"It must be Presley's incessant beat that sends them," said an aviation official.

A solution of this problem has not yet been developed and proved to be effective. As one command stated, "this type of accident is virtually unavoidable unless some means can be devised to discourage birds from resting on the runway." APPROACH invites your thoughts and suggestions on the matter. ●

POWER FAILURE (bird and plane) occurred during practice GCA run when bird was sucked into carburetor air inlet, left. The pilot was forced to ditch his AD-5, right.



NOTES FROM YOUR FLIGHT SURGEON

A Classic Example

A FLIGHT surgeon recently reported what he described as a "classic example of the correct thought processes and procedures taught in all survival courses."

After a mid-air collision between two AD-6s, one plane returned to the base with only minor damage. The other went into an uncontrolable dive.

The pilot opened the canopy, hit the release on the seat belt and was forcibly thrown from the cockpit, evidently from the G-forces acting on him. After straightening his body out, he reached for the D-ring twice but could not find it. Remembering a training lecture which had advised looking down at the D-ring, he looked and saw it was lower than he had anticipated it would be. Seconds after he pulled the D-ring, the parachute canopy blossomed with a mild shock. The pilot made a smooth landing in a rice paddy where he was picked up a short time later. He was uninjured.

"Bailout and parachuting training movies and lectures were of definite significance in this case," the flight surgeon reports. "It is interesting to note that relatively minor points (such as looking to find the D-ring) can assume major proportions during such a time of stress. A memory pattern thus ingrained may be the factor which saves a man from panic at such a time when his life depends on it."

Remarkable

A PILOT flying a TV-2 ejected after the aircraft experienced material failure, engine explosions and fire. He landed in a flat freshly-plowed field. Aside from a few bruises, his only injuries were a sprained ankle and a mild pain in his right elbow and shoulder.

Investigation of the accident produced a remarkable piece of information: the pilot (who had approximately 3900 hours of flight time) had had essentially no training in the use of aviators' safety and survival equipment since he left flight school. He states he attended a demonstration and lecture on "Over Water Bailout" at Cherry Point "about 10 years ago." The reporting flight surgeon comments that it is surprising that a pilot with this length of service should not have had at least some refresher training in the use of aviators' personal safety and survival equipment.

OpNav Instruction 3740.3A states the requirement that flying personnel attached to activities operating service type aircraft with high altitude capabilities receive refresher training, including aviation physiology lectures and low pressure chamber runs *every two years*, and if the aircraft operated are equipped with ejection seats, training in ejection seat procedures in disarmed seats *every four months*.

Acey Deucy

AN F9F-8B aborted takeoff, ran off the end of the runway and exploded and burned. At the time the Medical Officer's Report was submitted the pilot still had amnesia concerning the events during the takeoff and the accident. He had no idea of how he escaped from the aircraft. He was first seen walking out of the smoke and carrying his helmet in one hand.

The pilot suffered burns about the head, right shoulder and right arm. He had played two games of acey deucy in the readyroom before his flight and had rolled up the right sleeve of his summer flight suit so he "wouldn't keep messing up the chips." He never got around to rolling the sleeve down.

The pilot's burns would have been considerably reduced had he also been wearing the Z-2 coverall G-suit underneath the summer flying suit as required by his Marine Aircraft Wing.

An endorser on the AAR states: "Reports continue to be received on pilots not wearing, or not wearing properly, expensive flight clothing and equipment that is designed specifically to protect them. This is strictly a matter of squadron indoctrination and squadron supervision. If pilots are fully aware of the risks they run by not properly protecting themselves, they will undoubtedly be more conscientious in this respect. An occasional inspection or even observation in the readyroom and on the flight line will certainly show up deficiencies as obvious as were present in this instance."

Fuel for Thought

DURING preflight inspection of an F9F-8B, while the pilot was inspecting the port landing gear the lineman climbed atop the port wing to open the access doors and gas caps to facilitate inspection. As he opened the main fuselage fuel cap, JP4 overflowed from the cell due to expansion during the heat of the day and poured on the pilot's back.

Instead of showering and changing flight suits, the pilot chose to continue the flight without delay. Subsequent events caused him to regret this decision.

During the flight, approximately a two-hour hop from chock to chock, the pilot perspired profusely. On completing the hop, he immediately took a shower, put on fresh clothes and reported to the dispensary. The chemical contact with the JP4 had resulted in 1st and 2nd

degree burns of the entire lower back requiring five days' hospitalization.

The reporting flight surgeon recommends that all persons coming in contact with JP4 should immediately remove the clothing over the affected area, wash thoroughly with soap and water, then report to the dispensary.

Summer Flying Gloves

THE following is quoted from ASO Logistics Bulletin 188:

"Based on reports received by the Naval Aviation Safety Center the brown summer flight gloves are considered a hazard to flight safety and are not to be issued to pilots.

"Unsafe flight conditions have arisen from snagging, inadvertent actuation of switches or levers, and poor feel leading to improper or incomplete operation of a control. The practice of wearing the gloves inside-out in order to minimize the stain problem increases the snag hazard by exposing untrimmed seams of the gloves.

"The brown gloves shall be disposed of by issue to ground support personnel and to non-pilot aircrewmen where the use of the gloves would not be a hazard in flight. Only cream colored summer flight gloves are to be issued to pilots. Except for size 10, adequate stocks are available to support requirements. A total of 91,824 pairs of cream colored gloves have been delivered since May, 1958. Rationing the limited stocks of size 10 cream gloves and issuing size 10 brown gloves to pilots will be necessary until sufficient quantities of cream colored gloves are available. Full support is expected (this summer)."

For stock numbers and sizes, see ASO Logistics Bulletin 188.

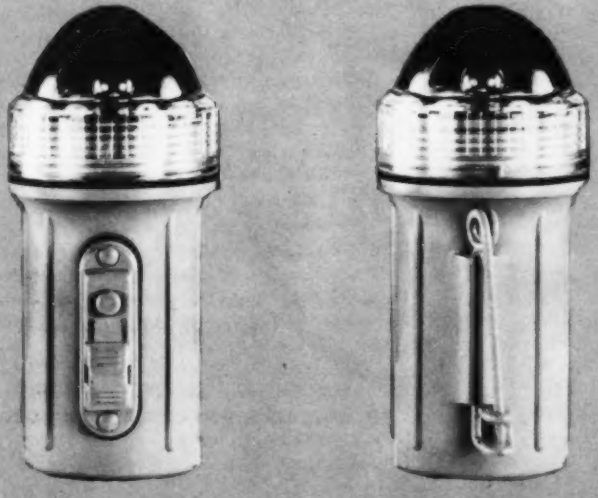
Give Them Time

RESCUE helicopter personnel should allow survivors ample time to position themselves correctly in the rescue sling and make sure by sight that they are in the correct position before beginning the hoist.

After ejecting from an F9F-5 over water, a student pilot had difficulty getting into the helicopter rescue sling because of his inflated life vest. He entered the sling correctly but was only partially in when the helicopter crewman began to hoist him. The pilot signalled violently to be lowered and was returned to the water. Back in the water, he was again trying to fit the sling properly under his arms when he was hoisted a second time. He panicked momentarily during ascent when he swallowed water that was in his oxygen mask and the sling, still improperly adjusted, began to strangle him. However, he was hoisted rapidly and helped into the helicopter.

The survivor stated later that at no time had he given the signal to the helicopter crewman to hoist him.

Rescue actions must, of necessity, vary with existing circumstances. In case the survivor is injured or unconscious a crewman from the helicopter will probably go into the water to place the man in the sling, on the seat, or the rescue net may be used. However, generally speaking, an apparently uninjured survivor should be given time to position himself correctly in the sling before the hoist is begun. He should then give the signal and be hoisted to the helicopter. A poorly adjusted rescue sling can lead to panic which can complicate the rescue.



A new version of the one-cell life vest flashlight is available. The flashlight has an improved pin clasp and a larger, clearer plastic dome. The stock number is GF6230-255-0166—Light, Marker, Distress, Watertight.

A number of men have been rescued in night survival situations thanks to these little flashlights. *Every pilot and every crewman should have a one-cell flashlight secured to his life vest and should check it for proper operation before each flight.*

Hypoxia claims new victims every day — even among experienced aircrews. Here are four recent cases, together with some suggestions to combat the hazard.

HYPOXIA

IN THE dark early hours of a cold October morning last year, a pilot of an AD-6 mistook the orange harvest moon for the jet exhaust of an F4D and made evasive maneuvers to avoid it. Feeling "rough" and somewhat dizzy, he wound up his cross-country flight—sparks flying and sirens screeching—with a wheels-up landing.

The pilot's account of his experience plus the cracked and deteriorated oxygen feeder hose in the aircraft oxygen system point to hypoxia as the cause of his troubles.

This is but one of the hypoxia cases on record at the Naval Aviation Safety Center. To focus reader attention on the problems of hypoxia, APPROACH presents a number of other hypoxia cases from the NASC Aero-Medical Department files. (Your flight surgeon will be glad to discuss any specific questions you have about hypoxia or talk on the subject in general at one of your squadron safety meetings.)

Case 1: On a routine test hop, the pilot of an A4D-1 was conducting IFF checks with Jitney Radio. While passing through 26,000 feet, he noticed a slight increase in the usual amount of positive pressure in his A13A oxygen mask. Disregarding this, however, he continued his climb-out. At 28,000 feet, he received a blast of oxygen which lifted his oxygen mask up from his face. Thinking that his regulator was failing and that liquid oxygen might enter his mask, he released one side of the mask and let it dangle. He believed that he could obtain oxygen from the mask in time if he experienced symptoms of hypoxia. He leveled off at 30,000 feet and continued his IFF radio checks. Twenty seconds after he removed his mask, his arms and legs became numb and heavy and he began to lose consciousness.

The aircraft nosed over and began to descend. Although unaware of the passage of altitude or time, the pilot transmitted a MAYDAY, dropped his speed brakes and reduced power. His next realization of altitude was while passing through 5000 feet. He began his recovery and completed it at 2000 feet. On replacing his mask, he found that it was working normally. Feeling fully recovered, he cancelled his MAYDAY and climbed to altitude again to see if the oxygen regulator would malfunction a second time. (Some folks never learn!)

At 26,000 feet, he again experienced a slight build-up of positive pressure. Immediately he descended and returned to the base without reporting any further incidents.

Case 2: While on a tactical simulated strike mission in an A3D-2, the plane commander depressurized the cockpit at an altitude of 35,000 feet and sent the gunner-navigator into the bomb bay to investigate the possibility of a fuel leak or an inoperative center of gravity fuel valve. The gunner-navigator hooked his mask up to the bomb-bay oxygen regulator but disconnected it when he found his oxygen hose was too short for him to reach the CG valve. He proceeded to the CG valve, then lost consciousness in the middle of the bomb bay while attempting to reconnect to the oxygen supply.

The plane commander had stationed the plane captain at the companionway entrance to observe the gunner-navigator in the bomb bay. When the plane captain lost sight of him, he went aft to investigate. The bombardier-navigator took up visual watch in his place.

The pilot established a high rate of descent when the bombardier-navigator lost sight of the plane captain. Entering the bomb bay, the bombardier-navigator found both men unconscious, one on top of the other, in the center of the bomb bay. He pulled the gunner-navigator's bailout

Continued from preceding page

oxygen bottle. Shortly afterwards, the gunner-navigator regained consciousness. The bombardier-navigator was connecting the plane captain to the bomb-bay oxygen station when he regained consciousness. At this time, the aircraft was below 10,000 feet. The bombardier-navigator helped both men back into the cockpit where they were placed on 100% oxygen. When the aircraft returned to the carrier, the crewmen were taken immediately to sick bay for observation.

(The Handbook of Maintenance Instructions for the A3D-2 states that the aircraft should carry a portable oxygen unit comprising a 96 cubic inch capacity supply cylinder, a regulator and a mask hose. The unit is carried under the gunner's seat.)

Case 3: The pilot of an F9F-6 became unconscious while flying at 35,000 feet with a cabin altitude of approximately 18,000 feet. His hypoxia was attributable to faulty maintenance. The flexible oxygen hose in the aircraft pulled loose from its clamp on the console. Cockpit air entered the hose and no oxygen was drawn through the regulator. The hose pulled loose for two reasons: 1) the clamp holding the tubing on the pipe came loose because of improper installation, and 2) insufficient slack in the oxygen hose between the console and the clamp holding the hose to the side of the seat placed a strain on the hose when the seat was raised to full up position.

When the pilot preflighted his aircraft using the pre-takeoff check list, the oxygen system checked satisfactorily. Before takeoff, he switched to 100% oxygen.

The second aircraft in the flight joined him at about 7000 to 8000 feet and took the lead. While heading out to sea, the two aircraft climbed to 35,000 feet. After about 10 minutes at altitude, the pilot realized that he did not feel well and was having difficulty flying as wingman. His head felt light and his stomach "felt funny." He broke out in a sweat. Contacting his lead pilot, he stated that he did not feel well and wanted to return to the base. Although it did not occur to him that he might be hypoxic, he began to check his oxygen system. At this point he lost consciousness.

Diagram courtesy USAF.

symptoms of HYPOXIA

35 to 40 THOUSAND FEET	15 to 45 SEC'S.	IMMEDIATE UNCONSCIOUSNESS! (with little or no warning!)
20 to 25 THOUSAND FEET	5 MIN'S.	SAME SYMPTOMS AS "15 to 18" ONLY MORE PRONOUNCED WITH EVENTUAL UNCONSCIOUSNESS
15 to 18 THOUSAND FEET	½ HOUR	IMPAIRMENT OF JUDGMENT AND VISION, HIGH SELF CONFIDENCE DISREGARD FOR SENSORY PERCEPTIONS, POOR COORDINATION, SLEEPINESS, DIZZINESS, PERSONALITY CHANGES—AS IN A MILD DRUNK-CYANOSIS (BLUING)
10 to 14 THOUSAND FEET	HOURS	HEADACHE, FATIGUE, LISTLESSNESS

When the pilot regained consciousness, the aircraft was in a steep dive at 5000 feet. He thought he was too low and too fast to eject and decided to attempt a recovery. Although he does not remember his altitude on recovery, he believes it was quite low. The aircraft accelerometer, which had been set at ZERO before takeoff, registered eight positive G.

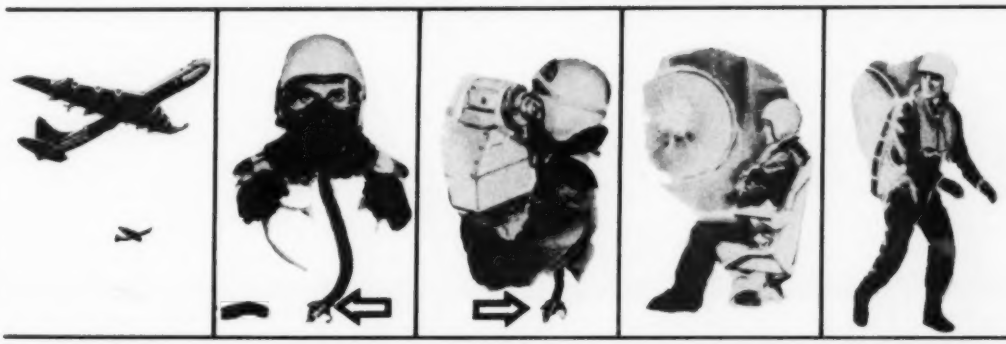
The pilot returned to the field with difficulty. During the return flight, he noticed that his oxygen blinker was not working. He turned on safety pressure but felt no pressure in his mask and removed it. Notifying the tower that he had passed out in flight and was entering downwind for a landing, he asked for the crash crew and ambulance to stand by. After a very low and slow approach, he made a successful landing. A flight surgeon met him at the aircraft. The only finding reported on physical examination at the dispensary was blockage of both ears which cleared up within a week.

The flight surgeon found on questioning the pilot that he had had low pressure chamber indoctrination only two days before the incident occurred. At that time, he had experienced no subjective symptoms of hypoxia although he had removed his oxygen mask at 18,000 feet in the chamber for three minutes.

Case 4: The LTJG took off in a flight of two A4Ds on a formation hop. Climbout to 40,000 feet was uneventful. As the two planes leveled off, the JG had radio failure. He recalled later that at the same time he had felt a wave of elation. In an attempt to regain radio contact, he tried several channels and wiggled his quick-disconnect on the panel. Believing that he was not getting enough oxygen, he tried to tighten the panel connection. As he did so, he accidentally pulled it out. He then disconnected his mask connection from the seat pan and tried to plug the mask connection directly into the panel oxygen supply. (Squadron pilots had been warned against this. Disconnecting the hose from the seat pan assembly eliminates use of the bailout bottle as a supplementary oxygen supply.)

At this point, he broke out in a cold sweat. His visual acuity and thinking processes were dimin-

TIME OF USEFUL CONSCIOUSNESS



FEET OF ALTITUDE	RAPID DISCONNECT (Sitting Quietly)	RAPID DISCONNECT (Moderate Activity)	EXPLOSIVE DECOMPRESSION (Sitting Quietly)	EXPLOSIVE DECOMPRESSION (AND BAIL-OUT)
22,000	10 min.	5 min.		
25,000	3 min.	2 min.	2 min.	1 min.
28,000	1½ min.	1 min.	1 min.	½ min.
30,000	1¼ min.	¾ min.	¾ min.	20 sec.
35,000	¾ min.	½ min.	½ min.	15 sec.
40,000	30 sec.	18 sec.	23 sec.	15 sec.
65,000	12 sec.	12 sec.	12 sec.	12 sec.

Continued from preceding page

ishing. Recognizing symptoms of hypoxia, the pilot realized that he would not be able to plug in the oxygen connection. He applied power and nosed the aircraft over in the hope that he would reach a lower altitude before losing consciousness.

By now, he was having considerable difficulty breathing. He pulled his oxygen mask off and leaned over the console to breathe the oxygen coming from the panel. At the same time, he placed the oxygen hose from the seat pan in his mouth and began to suck it. He does not remember the descent from 40,000 feet to 20,000 feet. At 20,000 feet at .92 mach, he retarded to IDLE and dropped his speed brakes. The pilot believes he leveled off at 9000 feet. At this time for some unknown reason he turned off the oxygen.

Observers in the air who were trying to attract the pilot's attention report that he leveled off at approximately 2000 feet, then headed for hills 2500 feet in height with his speed brakes out. At the time he started his descent from 40,000 feet, a second flight of A4Ds in the immediate vicinity was alerted to the situation by the radio calls of his chase pilot. The leader of this flight spotted contrails from the hypoxic pilot's aircraft and immediately gave chase, catching up with him about 2000 feet above the terrain.

Flying alongside and slightly ahead, the flight leader was able to get the hypoxic pilot to acknowledge his presence. In response to frantic hand signals, the pilot closed his speed brakes and added power. Since the pilot was responding correctly to hand signals and giving a "thumbs up" on his personal condition, the flight leader switched to tower frequency and received clearance for a straight-in landing approach to the duty runway. Passing through 200 feet, the flight leader gave the JG the lead and signaled him to complete the landing on his own. Although he was low and slow during the last three-quarters of a mile and had to add power, he made a normal touchdown and rollout.

After the pilot taxied to the line, he was taken to dispensary. On examination he showed no ill effects. Several hours later he suffered a mild headache which disappeared the following morning.

The oxygen system of the aircraft and the pilot's mask, regulator and hoses were thoroughly examined and tested. No malfunction or irregularity was noted. The pilot's statements in regard to this occurrence indicate a strong probability that there was a partial separation of the oxygen hose from the console-disconnect fitting. This disconnected the radio fittings and also allowed oxygen to escape around the fitting.

This incident, the FLIGA notes, points up another problem associated with the A4D oxygen system. In order to grasp the actuator of the bailout bottle, the pilot must first release his shoulder harness lock, then reach blindly for the actuator. "This necessary sequence of action, with the pilot in a hypoxic state, could well prove to be an impossible task," the FLIGA states.

(According to a Douglas Aircraft Co. representative, an A4D aircraft service change is coming out which will correct this deficiency. Incorporation of the change will replace the green apple with a pull ring located on the inboard side of the left hand seat pan thigh support. This location will permit manual actuation of the emergency oxygen when the pilot's shoulder harness is locked and the inertia reel is fully retracted.)

COMBATING THE HYPOXIA PROBLEM

- *Thorough knowledge of oxygen systems and equipment.*
- *Rigid oxygen discipline.*
- *Proper maintenance and use of aircraft oxygen systems and aviator's personal oxygen equipment.*
- *Continual training and refresher training in the dangers of hypoxia and in the use of oxygen.*

Combating the dangers of hypoxia is an all-hands job. OpNavInstruction 3740.3A spells out individual responsibilities and training requirements in connection with the aviation physiology training program. But no matter how many persons share the task of combating hypoxia, the final responsibility lies with the pilots and crewmen themselves. All the training, maintenance and supervision in naval aviation is of no avail unless the men in the aircraft know and make proper use of their personal oxygen equipment.

HYPERVENTILATION vs. HYPOXIA

MOST of us in the flying game have, at some time or another, run into a situation where we have found ourselves suffering from a lack of oxygen.

Maybe it was the time you were on the cross-country in the Beechcraft and found it necessary to climb to 13 or 14 thousand feet. Or maybe it happened only in the flight physiology unit where some guy spent all morning harping on the necessity of oxygen at altitude and then took your mask away from you at 30,000 feet in the chamber. At any rate we have all experienced hypoxia in some form. We've had the symptoms of hypoxia drilled into us over and over—we've become finger-nail watchers of the highest order, but most of us realize that by the time the nail beds turn blue the brain is likely to react as though it had been soaking overnight in a bucket of Martinis.

Seeing as how the brain is the most active part of a man's body (this is a broad generalization), it gets in trouble at the first indication of hypoxia so that the blue fingernails may prompt only a mental note to see if Helena Rubinstein manufactures the same shade 'cause it sure would be nice if you and the girl friend had matching fingernails.

Don't worry about getting too much oxygen while you're flying around. Lots of us have heard all sorts of hairy stories about oxygen poisoning, but at pressure less than one atmosphere oxygen is one good thing you can't get too much of. However, the way in which we get the oxygen may foul us up. Naturally we get it by breathing, but it's not just an accident that we all breathe at about the same rate.

One of the primary controlling factors in regard to rate of respiration is the amount of carbon dioxide that is dissolved in our blood. If we've been working hard, we breathe faster to get rid of the extra carbon dioxide our bodies are producing. On the other hand if we aren't very active as, for example when we're asleep, there isn't very much carbon dioxide being produced, so the rate of respiration drops off. Now if for some reason we start to breathe rapidly without an increased amount of carbon dioxide being produced, we tend to lower the overall carbon dioxide content of the body. This is what happens when we hyperventilate. The "where did everybody go" feeling we get plus the tingling sensations in the hands and feet does not have anything to do with oxygen. It is strictly a result of lowered carbon dioxide content.

The respiratory center which is located at the top of the spinal cord initiates impulses to the lungs to go through the motions of breathing. When the carbon dioxide content is lowered the center attempts to slow down the respiration rate but it is not always successful. The lungs get more or less carried away with the program and keep on wheezing away. . . . Once you've inhaled you don't want to do it again until you've exhaled. Finally the whole situation gets out of hand and the respiratory center steps in and plays the ace of trumps. It knocks you colder than a ptarmigan's feet.

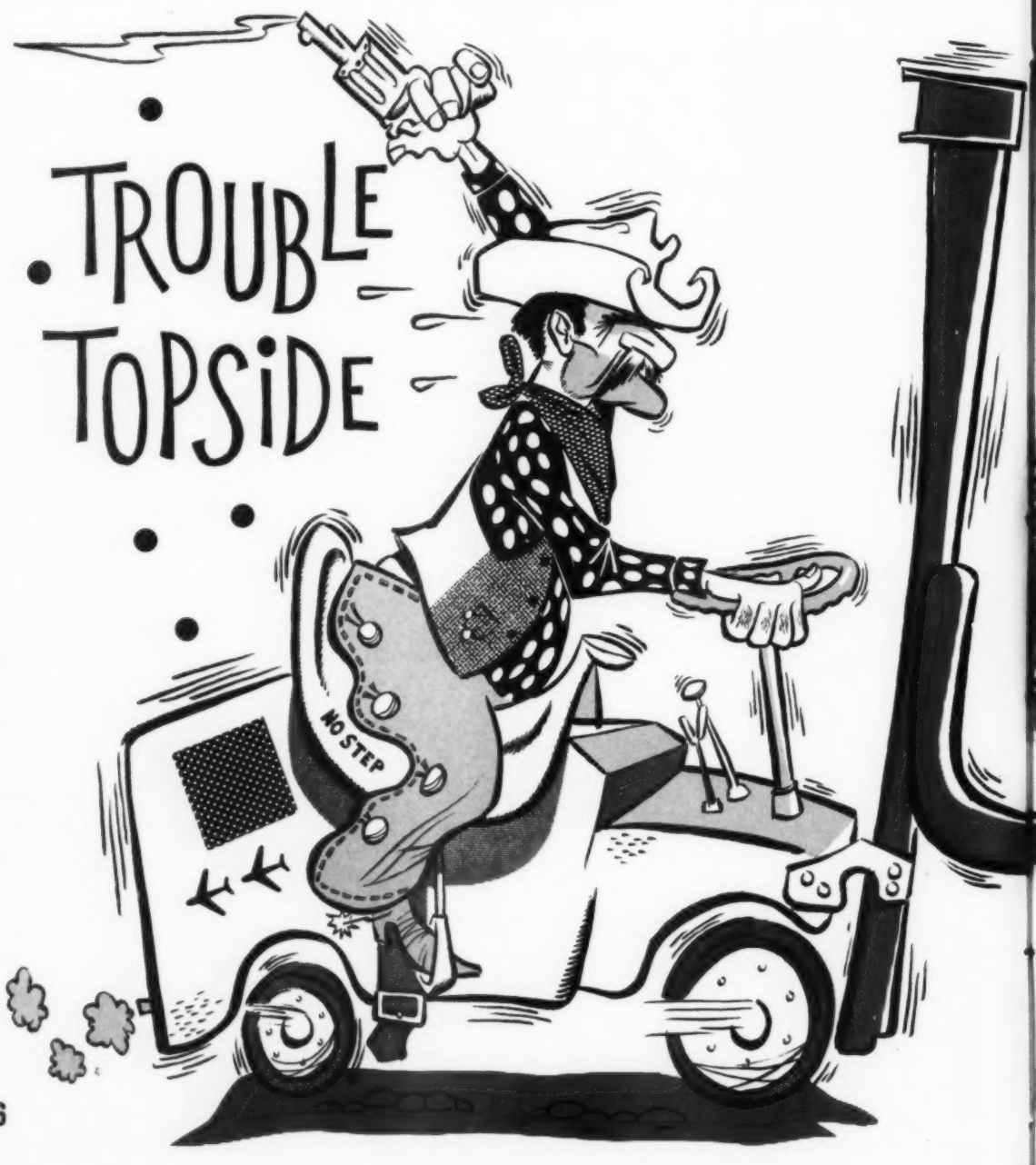
The respiration ceases at this point in order to allow the carbon dioxide content of the blood to build back up to normal. However, with the cessation of respiration the oxygen content of the blood drops. Finally a couple of centers around the heart become alarmed about the low oxygen content in the blood and they send a message to the lungs which in effect says, "Breathe you jackasses, before we all die." Respiration starts again and consciousness returns.

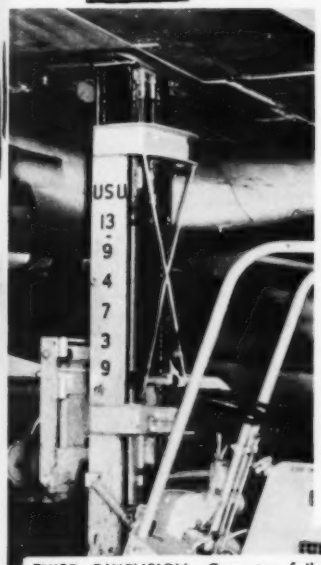
Unconsciousness at any time is an undesirable condition but particularly so in an F9F at 40,000 feet. Ordinarily, consciousness returns in a short period of time and you hear music—your altimeter singing "Nearer My God To Thee." Your airspeed indicator shows you still have a little disance between the needle and the Mach indicator, but what you may not know is that the needle has lapped the Mach indicator twice!

If you experience strange sensations at altitude take corrective steps for hypoxia first, i.e., switch to 100% and breathe slowly for 30 seconds. If you don't feel better in 30 seconds then hold your breath as long as you can. If you were hyperventilating you should be able to hold it for a minute or more with no strain. If you rule out hypoxia and hyperventilation and you still feel rocky, start looking for some place to land. It could be carbon monoxide . . . (or other toxic fumes) or on the other hand maybe it's just not your day!

—Adapted from
CNAVanTra "Flight Safety"

Instructions in safe driving procedures must be paralleled by careful selection of personnel who can be entrusted with the requisite responsibility of vehicle operators, if accidents of this nature are not to recur.





THIRD DIMENSION—Operator failed to realize boom height; raised lift, poked hole through wing.

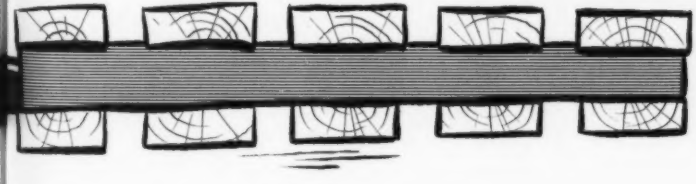
Forklift operators have taken the lead in the plane punching rodeo.

According to the latest tabulations by the Naval Aviation Safety Center these "spurred" gentry have earned this dubious distinction by punching holes into wings, tails and fuselages of airplanes at the rate of 15 airplanes per quarter. Dollar loss in damages to these 60 airplanes per year is estimated to run well over a million dollars. Add to this aircraft utilization losses and we have a target worth taking more than a cursory potshot at.

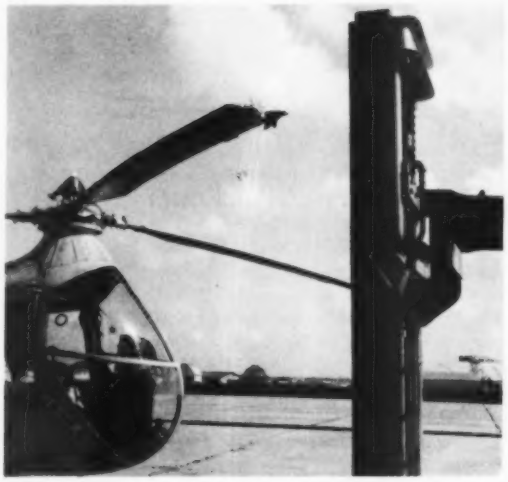
Until now NC-5 drivers had maintained the lead by damaging an average 23 airplanes per quarter, running the cost of damages into millions per year according to Bureau of Aeronautics estimates. Through an all-out concentration on the malpractices of drivers and redesign of faulty equipment, damage was reduced to a rate of 11 NC-5/aircraft accidents per quarter. A similar effort would reduce the forklift/aircraft accident rate proportionately.

"FOOT SLIPPED OFF BRAKE"—Non-slip material, rebuilding of worn pedal ears or spot welding expanded metal to pedals will help.

DRIVING BLIND—Operator was unable to see in the direction of movement of his vehicle due to the obstruction of the load. Steering signals are essential to prevent this kind of accident.



GROUND accidents in which vehicles have collided with aircraft have been the subject of study and concern for some time. Quite often the damage incurred is slight and the only immediate consequence is a delay in flight operations. However, there have been reported minor ground accidents which might have led to disastrous mishaps, had different circumstances prevailed. Related herein is part of a FLIGA report which proves the point that ground accidents can be extremely dangerous.



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of the crew assigned to fly the aircraft each made a separate and complete visual inspection. The Plane Commander noted that the cargo had not been removed from the previous leg and made arrangements for its removal. While approaching the aircraft to unload this cargo the driver of a forklift struck the leading edge of the left wing. According to his statement, he tried to get to the cargo door by going under the port wing of the aircraft, but found that he couldn't clear the aircraft. He, therefore, remaneuvered his vehicle around the opposite side of the aircraft to the cargo door. The damage to the aircraft was not reported.

This aircraft was subsequently flown and the damage was not discovered until a routine wing heat check was performed on climbout. Although the actual damage to the aircraft was slight, the seriousness of this particular damage cannot be over-emphasized. The damage resulted in complete loss of wing anti-icing ability on the port wing. When operating aircraft with all-weather capabilities, pilots frequently encounter conditions of heavy icing. *Had this aircraft, with 31 personnel on board encountered heavy icing, the conclusions, even to the uninitiated, are obvious.*

Accidents of this type point up weaknesses in the areas of supervision and training. Vehicle operators must be properly trained to drive their forklifts, and they must be impressed with the tremendous consequences of not reporting any damage to any aircraft.

Let's take a look into the underlying causes leading to these accidents.

First, some activities do not require operators to have even an ordinary Navy driver's license as a prerequisite to qualifying for a forklift oper-

Top:

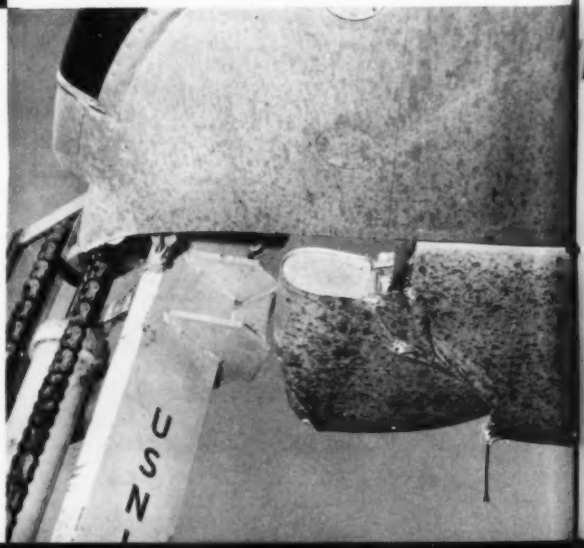
REASON ENOUGH—for the order: "Under no circumstances will any vehicle be driven so as to pass under the blades of a helicopter."

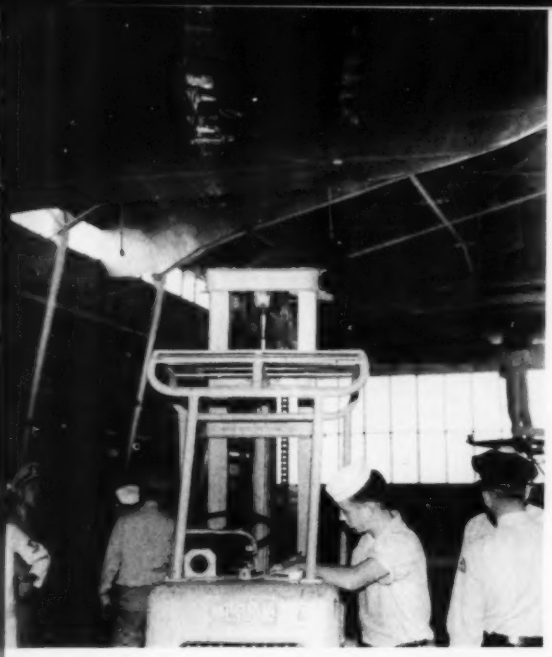
Center:

NO TRACTION—Beware of sea spray, residual fuel and oil on decks—Smooth solid tires and ship turns make forklift operation tricky.

Lower Right:

TROUBLE TOPSIDE—Always approach and back away from aircraft parallel to axis of wing and tail surfaces.





ator's permit. This fact accounts for the relatively high number of unauthorized drivers being involved in accidents.

Second, many activities do not require forklift operators to complete the course of instruction for forklift operation. Lack of basic training accounts for the following cause factors in forklift accidents:

- Moving loads without a director
- Inexperience or slow reaction
- Lack of physical coordination
- Error in judgment
- Visual error.

Recommendations resulting from an analysis of reported forklift accidents include:

► Review qualifications of drivers.

► Increase basic licensing requirements—(At least one command has initiated the practice of requiring its forklift operators to attend a Public Works or Supply School for forklift operators).

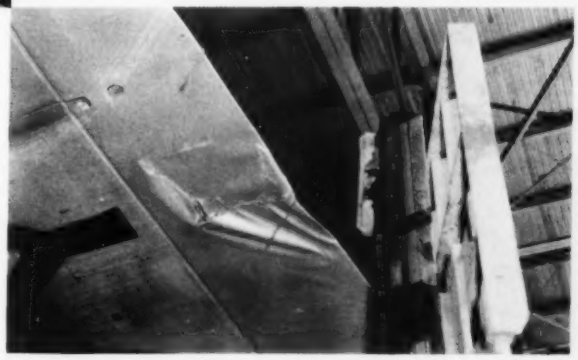
► Ensure that all unauthorized personnel are clear of the ramp area during loading and unloading of aircraft.

► Qualified forklift drivers be required to wear badges designating them as such while operating forklifts. (Already being done in some activities.)

► During forklift operations require that at least two persons be in attendance; one to be a petty officer to direct movement, operation and safety of vehicle; one to be a qualified forklift operator.

► Loadmasters in charge of loading operations be required to direct vehicles in every case when vehicles are moving about aircraft.

Note: One of the most effective means of eliminating this useless and easily avoidable accident is to ensure that supervisors are present during



Top:
TROUBLE TOPSIDE — Forklift damaged horizontal stabilizer of P2V—no safety observer was used.

Center:
HEADS-UP—While using a forklift to remove a searchlight from a P5M-2, hoist punctured wingtip float.

Lower Right:
WRONG APPROACH—Forklift backed under the wing of an R5D with hoist in raised position damaging the aileron.

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loading operations to direct our young and inexperienced drivers.

The following is quoted for information and guidance:

"*Licensed operators.* Forklift trucks, straddle trucks or industrial tractors shall be operated only by duly authorized operators who are specially licensed for each particular type of vehicle."—*U. S. Navy Safety Precautions paragraph 02341 OpNav 34P1.*

Forklift operators should familiarize themselves with details of Sections 02341 and 02342 of OpNav 34P1 USN Safety Precautions and the "Course of Instruction for Forklift Operators," contained in "Storage and Materials Handling," NavSandA Publication 284, Chapter 8. These publications are available through Forms and Publications Section of the nearest Naval Supply Center. Application must be made on DD Form 1149.

Of possible interest to squadrons are the forklift operator training schools such as those at the Naval Supply Centers, Norfolk and Oakland. Application for quotas can be made direct to these activities. The forklift operator's course includes a minimum of 40 hours basic classroom and driver practice training. While this course does not include training related directly to aircraft loading practices it is an invaluable aid to qualifying operators for aviation materials handling.

Aircraft loading procedures have been outlined by the USAF in its Accident Prevention Handbook AFM 32-3. Details which are pertinent to Navy loading practices have been extracted and were published in a recent issue of "Crossfeed." Contact your Aviation Safety Officer for details.—Ed.

There are a number of films available to Navy activities which are practical for use in connection with operator training. They are basic in principle and developed according to the Navy's concept of materials handling. The number, title and a short description of the content of each film follows:

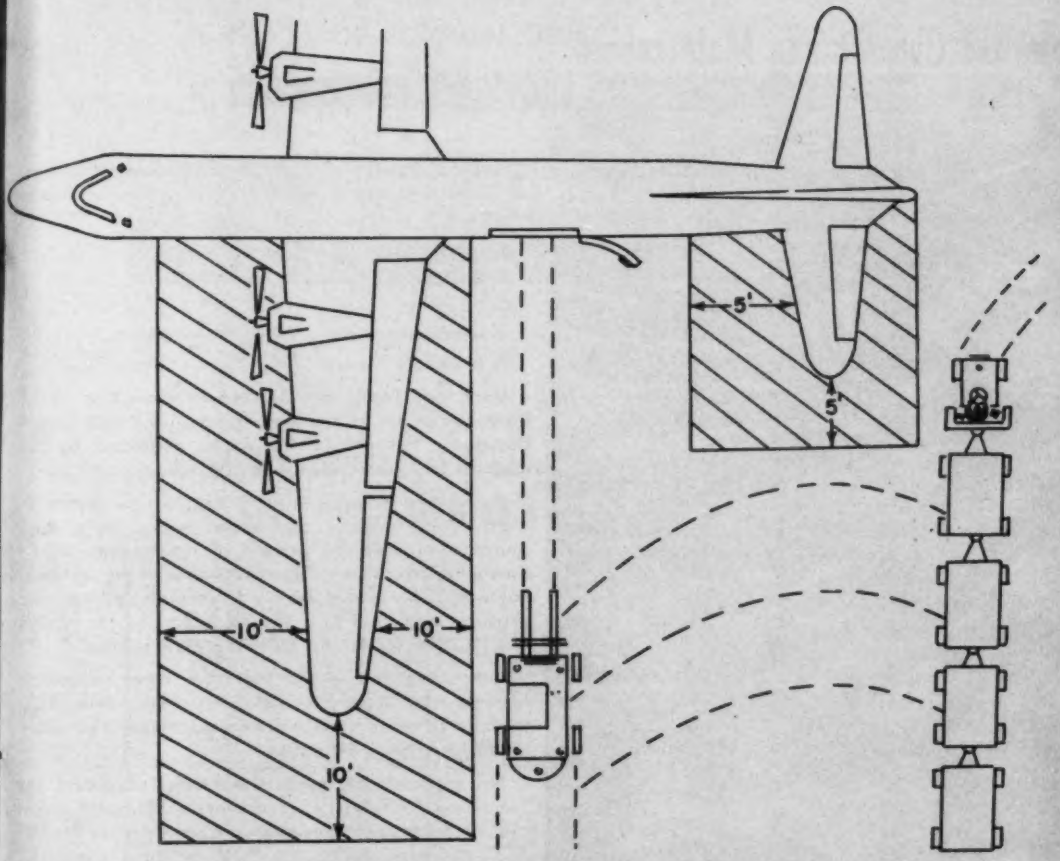
Number	Title	Summary
MA-5665	*Operators Care and Maintenance of Materials Handling Equipment*	The "Do's" and "Don'ts" for operation and maintenance of the forklift truck are demonstrated. Rules for safe operation of forklifts are illustrated and drivers' Daily Preventive Maintenance Service is explained.
MN-2294C	*The Unit Load*	Shows handling of supplies by unit loads from source to destination with the aid of fork trucks, street trailers, semi-trailers and tractors. Compares speed of handling palletized unit loads with hand and bucket brigade methods. Demonstrates use of the fork truck for loading lighters, freight cars and trailers.
MA-6862	*Materials Handling Methods*	Shows method of handling materials, particularly in large warehouses. Demonstrates proper methods of loading and unloading bulky equipment by means of forklifts, hand trucks, dollies, etc.
MN-7285	*Navy Materials Handling Equipment Operators*	A film developed at the Naval Supply Center, Norfolk, Virginia, emphasizing the rules and responsibilities of operators, approved materials handling techniques and demonstrating the proper uses of materials handling equipment.

There are also a number of appropriate motion pictures available through the different manufacturers of industrial equipment. This source provides a good supplement to the military films listed here.

Engine Removal Boom on Forklift Replacing Hand Hoist

BuAer reports forklift trucks with engine removal booms, procured by the SE Division, are doing away with the requirements for the hand-operated portable hoist. The hand-operated hoist will be removed from the allowance list as soon as sufficient quantities of the forklift truck with engine removal boom are available for fleet use.

Courtesy USAF



Guide for loading aircraft with forklifts, models R5D, R6D, R7V and WV —Striped portions show areas in which vehicles should not be operated.

TIPS

1. Check the condition of the forklift immediately prior to operating; check brakes, steering, overhead guard, horn, oil, gas and water. Report defects immediately to the supervisor.

2. Come to a full stop 25 feet from the aircraft; approach only under the direction of an observer.

3. Always remember, *space is three dimensional.* Stay alert, stay "heads-up" and lower the boom of the forklift whenever it is not required before moving in any direction.

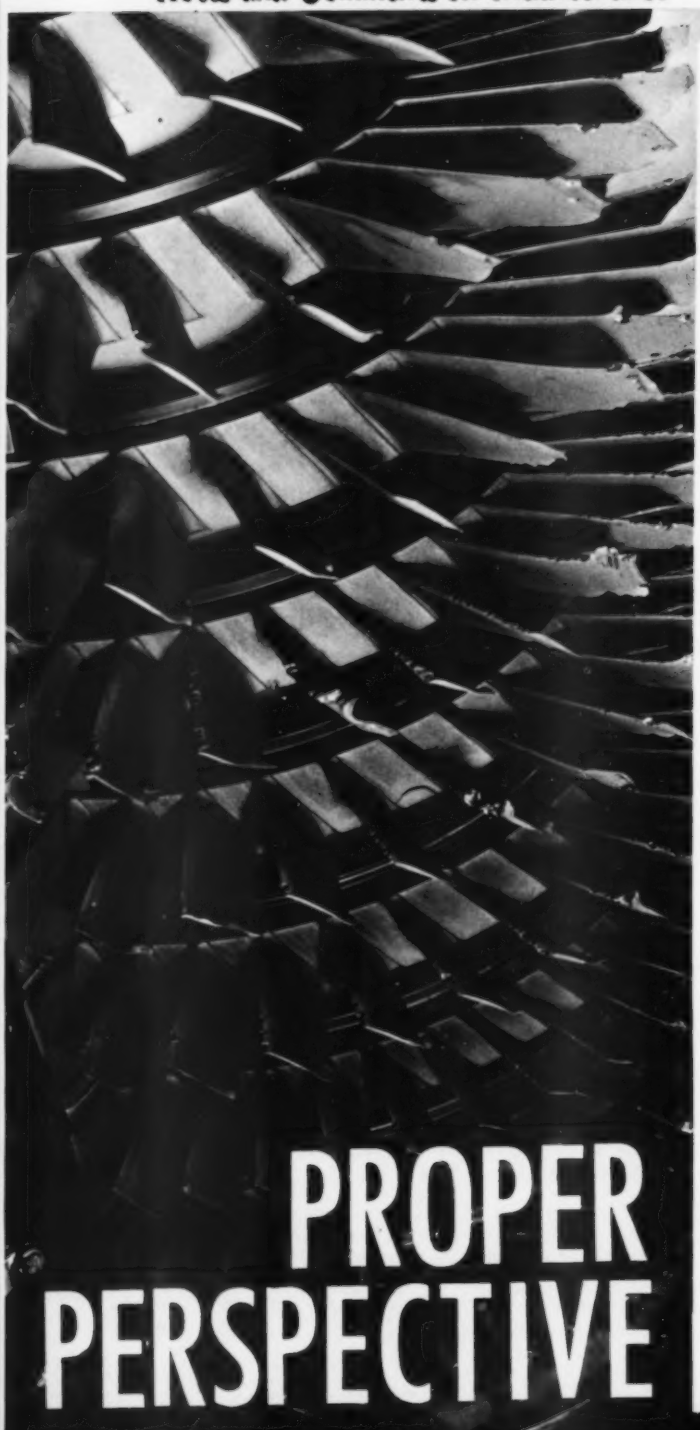
4. Approach and back away from aircraft parallel with the axis of wing and tail surfaces.

5. Never back a forklift in a restricted area without the assistance of a director.

6. On approaching an aircraft, forklift operators should exercise extreme caution and slow movements at all times; make sure additional men are in attendance of a vehicle when within the wing and tail radius of an aircraft.

7. Several cases have been reported wherein the operator's foot slipped off the brake pedal hitting the accelerator with the forklift's engine in gear. To correct this, some outfits have welded ears on pedals to prevent slippage, some have spot-welded expanded metal to the pedal, others applied anti-skid material as suggested by BuAer Notice 11200 dtd 30 Dec 1957.

8. Smooth, solid rubber tires on forklifts have little or no traction on any but a completely dry surface. Combinations of sea spray, residual fuel and grease on deck and unannounced turning of the ship make shipboard operation of forklifts especially hazardous. Use good judgment.



PROPER PERSPECTIVE

STUDIES indicate that the primary causes for premature jet engine removal in the order of importance are:

1. Foreign Object Damage
2. Overtemperature
3. Vibration
4. Oil Consumption
5. Accessory Failure

Much has been accomplished in correcting all of these causes except the leading cause, Foreign Object Damage. This area seems to be neglected by the majority of squadrons as well as overhaul activities.

Contrary to popular thinking that foreign objects on flight decks, runways, and taxiways are the primary source of trouble, 80 percent of the foreign objects damaging aircraft engines are introduced during maintenance. This is due mainly to careless maintenance practices and, lack of a specific inspection for foreign objects prior to turn-up following maintenance.

Supporting this is the fact that Forced Landing, Incident and Ground Accident Reports involving FOD indicate 70 percent occur during maintenance or within the first five hours thereafter.

No predominant trends were detected during the remaining 55 hours between checks. The high-to-low cycle repeats itself somewhat consistently. The type of FOD occurring during the "lull" between checks involves bird ingestion during flight; jets blasting debris into intakes of following aircraft during taxi; vortices picking up loose objects from flight decks, taxiways, runways . . .

It appears that if a concentrated effort were made to remove foreign objects following maintenance a significant reduction of FOD would be realized. One sure way to achieve this is for supervisory personnel to prohibit turn-ups until thorough inspections for foreign objects are made.

Operating and overhaul activities should require foreign object inspection prior to run-up following maintenance and a verification of same by a responsible person other than the person signing off this inspection.

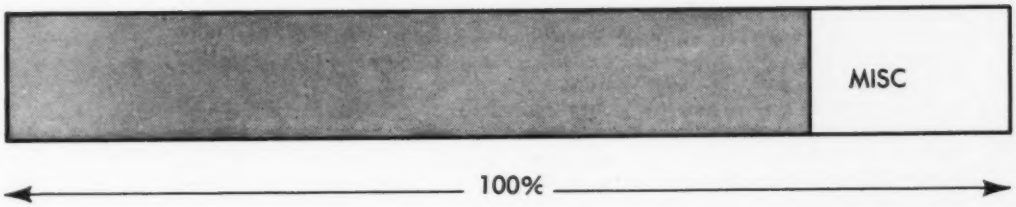
An aggressive and continued educational program apprising all concerned of these facts should also be quite effective in reducing FOD.

In view of these conclusions, a vigorous pursuit of the FOD program in all areas should continue. However, these glaring instances of neglect must be placed in their proper perspective if we are to achieve FOD reductions of significance.

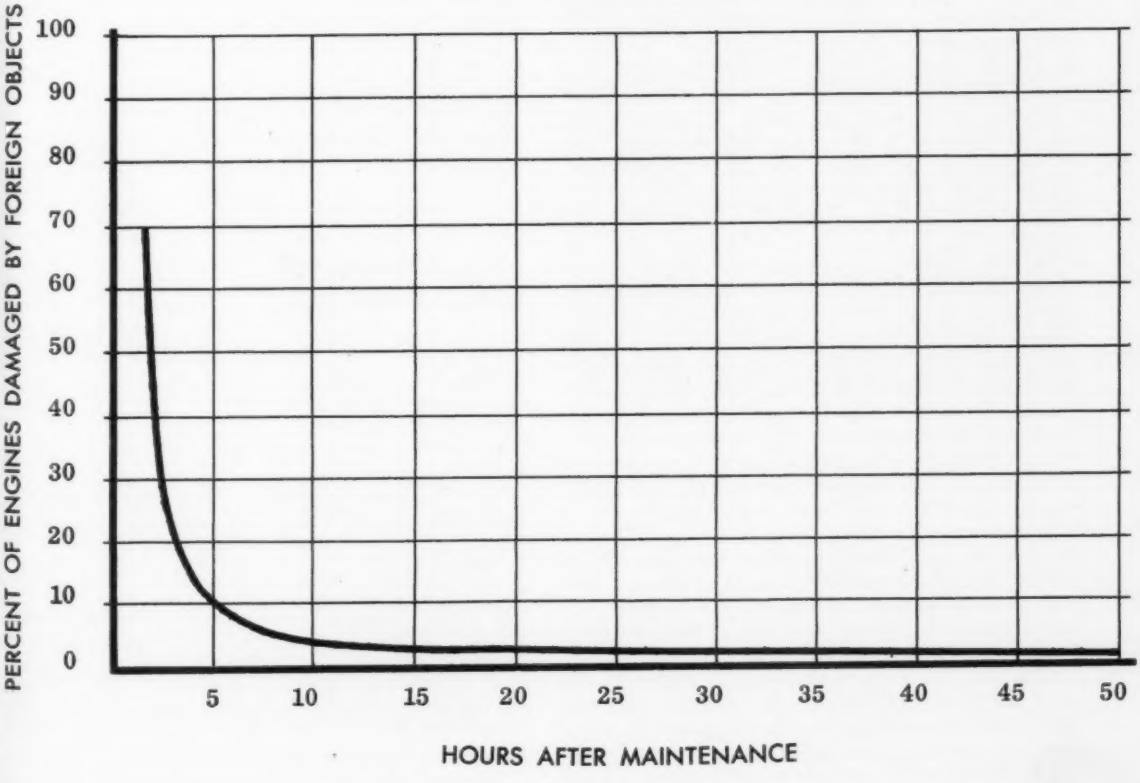
PERCENT OF ENGINES DAMAGED BY FOREIGN OBJECTS 1

80% OF FOREIGN OBJECTS ARE INTRODUCED DURING

MAINTENANCE



70% OF ALL FOD OCCURS DURING MAINTENANCE OR WITHIN 5 HOURS THEREAFTER.*



* BASED ON FLIGAS INVOLVING FOD REPORTED TO NASC FROM 1 JAN TO 1 OCT 1957 (63 ENGINES) FJ, F2H, F3H, F11F, F8U, A4D, A3D, F4D AND F3D AIRCRAFT.

Continued from preceding page

TOOLS IN THE GROOVE—The pilot was turning up his FJ-3 for takeoff and power was stabilized at 98%, TPT normal. A muffled explosive sound was heard and TPT climbed to 800°. The pilot reduced power, returned to the line, and made a preliminary inspection of the aircraft. At this time damage to first stage compressor rotor blades and metalization in the tailpipe were noted.

Prior to removal of the engine, a detailed inspection revealed part of a socket universal in the groove between the fuselage inlet and engine inlet. This object was not visible to the inspector, who was inside the inlet duct, but was discovered by a fingertip inspection of the groove.

A preflight inspection of the aircraft by the plane captain prior to this incident included a visual examination of the interior of the inlet duct. This was accomplished by the plane captain actually getting inside the duct.

In view of the fact of two visual inspections failing to disclose the socket universal, it was assumed that personnel working on the starter generator prior to the flight had left the tool lodged in the groove between the engine inlet duct and the fuselage inlet duct.

To prevent subsequent damage of this nature, maintenance crews and plane captains have been instructed to make fingertip inspection of this groove. *Use of a vacuum cleaner is also recommended.—Ed.*

TOUCH TEST—About 10 minutes after shutdown the F2H-3 was fueled with approximately 85 gallons of JP-3 before the fire started. The aircraft caught fire in the vicinity of both engine tail cones during normal refueling operations. Overhaul damage was sustained by the aircraft.

The fire was caused by spilled fuel from the fuel tank filler cap area, which ran down both sides of the fuselage onto the hot engine tail cones. A blow back of air, a sudden increase in pressure on the fuel line and/or a momentary withdrawal of the fuel nozzle from the filler neck caused the fuel to overflow the filler access area. A thorough investigation of the tank interior, the fuel vent lines and associated check valves did not uncover any explanation for a blow back of air from the tank.

The reporting command reemphasized that extreme care be taken to avoid spillage, and that a wait period of 15 minutes before refueling the aircraft to allow the engines to cool properly. This period of wait is somewhat arbitrary due to a lack of quantitative data and/or expert opinion to show the results of variations in outside air temperature, surface wind direction and velocity, type of fuel, and other factors. To arrive at the "optimum period of wait" all the factors which determine the "minimum safe wait" must be considered plus a factor for the tempo of operations. The "optimum period of wait" must obviously be greater than the "minimum safe wait" but the difference between the two in many cases represents lost time. More than 15 minutes will be used when practicable.

Endorser's Comments:

At no time can safe fueling procedures be subordinated to lowering turn-around time. However, operational necessity will, at times, preclude waiting until engines are completely cool before fueling. It is requested that the Bureau of Aeronautics conduct tests under the most adverse conditions of ambient heat with properly instrumented aircraft to determine how soon after shutdown a given type may be refueled. In the meantime it is recommended that the duration of the "wait period" be established in each individual case by a bare hand touch test of exposed parts of the engine tail section before refueling is commenced.

LOCK NUTS—Every now and then a report comes in on self-locking nuts which don't lock. Also, there have been some indications in the factory and appropriate inspection procedures have been initiated.

However, not enough FURs have been submitted to indicate whether or not this is a problem.

Now nuts and bolts are too often taken for granted, and if they're defective they're replaced with little or no thought. But remember, one of them can make a shambles of a jet engine in the wink of an eye if it finds its way to the compressor. Even if this doesn't happen, a terrific strain may be put on the remaining parts holding an important engine component.

Generally, self-locking nuts and bolts should be good for several removals and installations. But, if you find them loosening, don't keep it a secret. Shoot in those FURs, tout de suite — *GE Jet Service News.*

THIRTY FEET—A HOK's rotor blade was struck at the tip by the forward ladder of a refueler tank.

The refueler driver attempted to drive the refueler too close to the aircraft and misjudged his clearance of the rotor blade. Vehicle operators are being instructed to remain 30 feet from all aircraft.

Instructions of flight line personnel will emphasize that securing the rotors with blade boots will not be done until the aircraft has been received.—*2d MAW*

REMOTE CONTROL OF HIGH PRESSURE AIR—Recently there have been a number of accidents while using high pressure air compressors, which have resulted in personnel injury and aircraft damage.

The following examples point out typical errors.

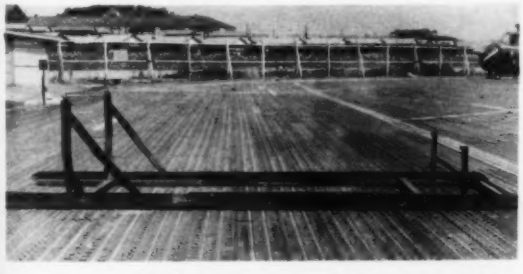
When the nose strut of an aircraft failed to extend, the operator exceeded the maximum allowable pressure and the strut was torn from the aircraft.

Two maintenance crewmen were inflating a tire on an aircraft with the high pressure side of a compressor. The tire blew out injuring one of the crewmen and a bystander 50 feet away.

The Navy stocks a high pressure remote control unit consisting of a spring-loaded shut-off valve, bleeder valve, a high and low pressure gage, and hose quick-disconnect plugs. The Federal stock number is R4910-204-2354-G311.

A daily inspection of compressors for preventive maintenance purposes is necessary to insure proper functioning. Even though operating instructions vary with commands, each contains the basic information for safe operation of the equipment. To insure compliance, a copy of this instruction should be placed in a conspicuous place on the compressor for ready reference. Strict adherence to the instruction should greatly alleviate the dangers involved.

CHOPPER TRANSPORT TIP—If helicopters are to be transported on aircraft or vehicles, it is recommended that a skid be designed that will provide some shock absorbing qualities and will provide adequate supporting points on the aircraft to eliminate stress to the airframe from jolting. It is further recommended that movement over highways be employed as a last resort and then



only when a relatively smooth surface is available. However, if the type skid shown above must be utilized, it is recommended that the engine be removed from the aircraft.—*From a FLIGA Report involving an HRS-3.*

FUEL NOZZLE CHECK—Soon after returning from a flight, an A4D-2 was being refueled. The plane captain connected the single-point fueling nozzle in the after fuselage bay, and the refueler driver began pumping fuel to the aircraft. Almost immediately the hose coupling at the fueling nozzle dropped free and fuel sprayed into the after fuselage bay and onto the deck below the plane before the driver could stop the flow.

Apparently the hot engine ignited the JP-4 in the after fuselage bay and the fire spread rapidly to the fuel on the apron around the plane. Prompt action on the part of the driver, who stopped the flow of fuel after only 18 gallons were pumped,

Lack of a lockwire caused the hose coupling to drop free of fueling nozzle spraying fuel into the after fuselage bay and onto the deck around A4D-2. Flight line personnel subdued fire, apparently ignited by hot engine. Photo above shows correct installation of lockwire.

reduced the severity of the fire. Flight line personnel almost completely subdued the flames with CO_2 prior to the arrival of fire fighting equipment. The aircraft sustained minor damage.

The uncoupling of the hose was caused by lack of the lockwire (photo shows the correct lockwire installation). A detailed search of the area failed to produce the lockwire. Since the fueling nozzle is removed each morning to allow recirculation of fuel, the lockwire could possibly have been lost during the operation.

Squadron personnel have been instructed to inspect for the lockwire prior to each refueling cycle.

Please turn page

Continued from preceding page

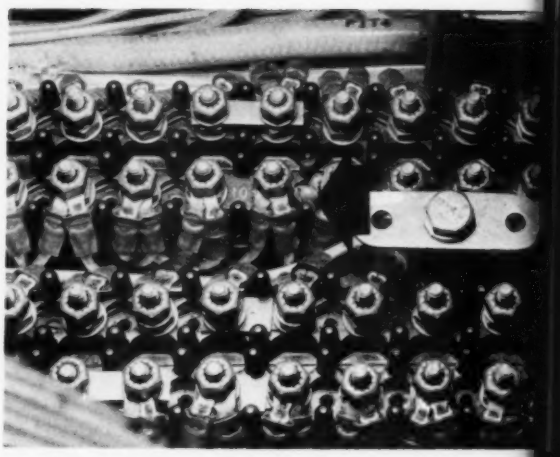
STOP NUT CHANGE—During the climbout, the FJ-3 pilot noticed his engine unwinding. He immediately checked throttle position at full forward, then turned toward the field. The throttle was retarded to off. He realized at this time that there was a power failure rather than a flameout. Further airstart attempts would be futile, so the pilot returned to base and made a successful flameout approach at idle thrust.

The aircraft power control rod and the fuel control engine control lever became disconnected due to the elastic stop nut backing off. This caused the power to reduce to idle. The elastic stop nut should have been replaced by a steel stop nut as per instructions in a local standing work order. Information concerning the replacement of the elastic stop nut by the steel stop nut is also contained in Illustrated Parts Break-down FJ-3/FJ-3M. *The squadron maintenance section interpreted the Work Order to mean replacement of the elastic stop nut at the next check rather than immediately.*

All elastic stop nuts have been replaced by the steel nut and stop nuts will be used only once. Check for security of the stop nut will be made by all plane captains and pilots during preflight procedures. In addition, it was recommended that a fail-safe device which will allow not less than 80% rpm in the event of similar or other failures with the F-65 fuel control.

SHORTED OUT—Shortly after takeoff an F9F-8 encountered a flameout followed immediately by an electrical fire and battery explosion. The pilot made a forced landing in a cultivated corn field. On touchdown at an estimated airspeed of 150 knots the aircraft rolled through a barbed wire fence and the left flap and right intake lip were damaged by contact with a fence post. The aircraft continued to roll across the unprepared terrain for 1725 feet and came to rest. The pilot abandoned the aircraft and awaited the arrival of the rescue helicopter. There was no fire following the forced landing.

The cause of this flameout and subsequent forced landing was the presence of a loose screw in the right console electrical distribution box. The loose screw made electrical contact with the electrical wires connecting to the terminal strip at junctions F 11 (engine start master wire K 410 U 25 normally on during flight) and F 12 (generator field lead wire P 16 G 14). The resultant short allowed the generator field voltage exertation to rise to the battery voltage, 24 volts, and to bypass the



voltage regulator which would normally control the generated voltage. Bench test of regulators indicates that the normal field voltage applied to the generator varies between 5.8 volts and 8.5 volts depending on the electrical load placed on the generator. The 24 volts applied to the generator field by the shorted circuit caused an excessive voltage and amperes to be applied to all the electrical systems on at the time. The estimated voltage is 80 volts and estimated amperes is 450 plus. For a comparison the large electric arc welders have an output of 78 volts at 200 amps.

In addition to the loose screw (see photo) found in the right console distribution box there was one piece of bonding wire 4 inches long removed from the area. The most probable source of these is that the foreign metal objects were left in the console when the aircraft was overhauled.

Recommendations: That the electrical consoles be opened and inspected to all acceptance checks and cleaned with a vacuum cleaner to remove any foreign metal objects that may cause a short circuit of the electrical system.

That BuAer incorporate a service change to retrofit F9F-8B aircraft with an over-voltage protection circuit to prevent accidents of this nature. The F9F-8T presently has an over-voltage protection circuit incorporated.

Wing Walkers and Plane Directors, Note!

"I personally feel responsible for this aircraft ground accident because I became so involved with the starboard wing clearing the parked truck that I forgot about the tail section and the small hut."—*From a Fliga*

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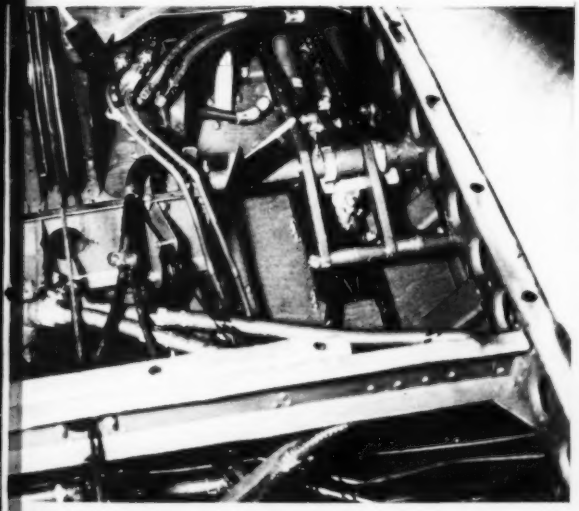
MURPHY'S LAW*

BOOBY TRAP!

A *Beechcraft* pilot began taxiing from the ramp and in pressing the right brake pedal in an attempt to turn, he noted the aircraft turned to the left. Upon pressing the left brake, the aircraft turned to the right. He immediately shut down the engines and cancelled the flight.

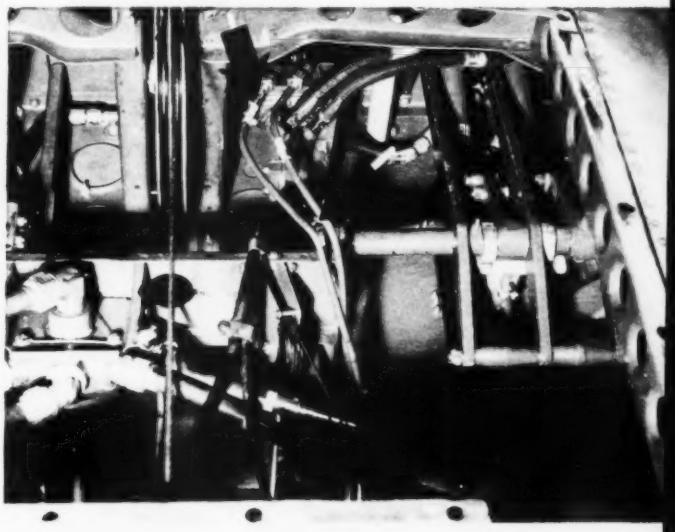


Mechanics were "booby trapped" into hooking up brake lines in reverse because incorrect installation above, looked better than the correct installation, right.

During the installation of a new parking brake valve assembly the right-hand tube assembly was connected to the left port of the parking brake valve assembly, and the left-hand tube assembly was connected to the right port of the parking brake valve assembly. This condition reversed the pilot's braking action. The photos above reveal the correct and incorrect methods of installing these tubes.

The reporting unit posted copies of these photographs with appropriate remarks directed to all maintenance personnel, in order to prevent a recurrence of this incident.

However, in the opinion of the Investigating Board, this installation is an example of a "Murphy" design. As noted in enclosures (1) and (2), when it appears that the lines are correctly installed, they have been reversed.—*Contributed by NAS, New York.*



* If an aircraft part can be installed incorrectly, someone will install it that way!

Clipboard

"If you have plans for tomorrow, be careful today."

Wisdom

THE bitter lesson must be learned by each pilot before he becomes a believer. He must go painfully through each stage of curiosity, fear, excitement, expectation, exhilaration, anticipation, self-satisfaction, boredom, and some close calls before he gets impressed on him indelibly that there is something to this business of benefiting by the mistakes of others.

How many pilots do you know of who made more than one unintentional wheels-up landing?

They learned their lesson the hard way and are as religious about putting their gear down as a swimmer who takes a deep breath before he goes under water. No one can defy the law of gravity any longer than it takes his aircraft to run out of fuel.

Why is it then that some pilots, with the very least an expensive aircraft on their hand, allow themselves to face a battle they can't win?

The answer is simple. They don't even think of the possibility because such a thing is so intangible. All the hard knocks and bitter experience of every pilot who has gone before falls on deaf ears because these hard knocks and experiences must be lived through to be believed. This has proven true in every walk of life and is one of the reasons why some people are put on this earth to keep their fellow men pointed in the right direction.

In aviation it is the intangibles that we in safety must continue to fight. The mechanic leaves his monkey wrench in the control cable because he doesn't have to fly the airplane. The refueler dumps contaminated fuel in the tank for the same reason. If a pilot doesn't crack up after a safety lecture on precision landings, he thinks he is immune.

We have pinpointed a specific problem. That problem is to convince you that you KNOW precision flying will keep you from becoming a believer the hard way. Look around you. You'll see the pilots who will never have an accident because they know how to profit by the mistakes of others. Are you one of them?

—2nd MAW "HOT DOPE Sheet"

Landing Hindsight

THE following is reprinted from a pilot's statement from an AAR involving a landing accident. Although it is not a recent accident, the philosophy has never been expressed better.

"Hindsight is a poor medium of thought for aviators in this age of speed. However, I can't resist the urge to state that had I obeyed my first instinct on the initial landing to 'take it around,' this needless accident could certainly have been prevented. Previous 'luck' in handling poor approaches (show me the pilot who hasn't gotten by with a few) gave me a false confidence in that split second that 'I can handle this one too.' Experience, I know, is a hard school. It's true that fools will learn in no other. I sincerely hope that some of the smarter (and younger) aviators can learn to 'believe' from other people's experience, and learn that the temporary blow to pride caused by taking a waveoff is certainly insignificant compared to the permanent loss of prestige caused by becoming involved in a poor landing that necessitates an AAR and another figure in the 'pilot caused accident' column."

—1st MAW "Wing Tips"

Magnetic Compass Deviation

THE CAA has reported that an airline recently experienced a 15 degree magnetic compass deviation when the landing gear was retracted. Investigation by the operator disclosed that the nose gear tire bead wire pile had become magnetized. Further investigation revealed several other tires in the same condition.

In analyzing this problem it was learned that both tires and struts can be magnetized by either lighting discharges or inadvertent coiling of the ground power cable around the strut or tire. This condition can be corrected only by demagnetizing or replacing the offending part.

In view of this, it is suggested that every effort be made to keep from placing ground power unit cables on or near nose gear struts and tires.

—FSF Mechanics Bulletin

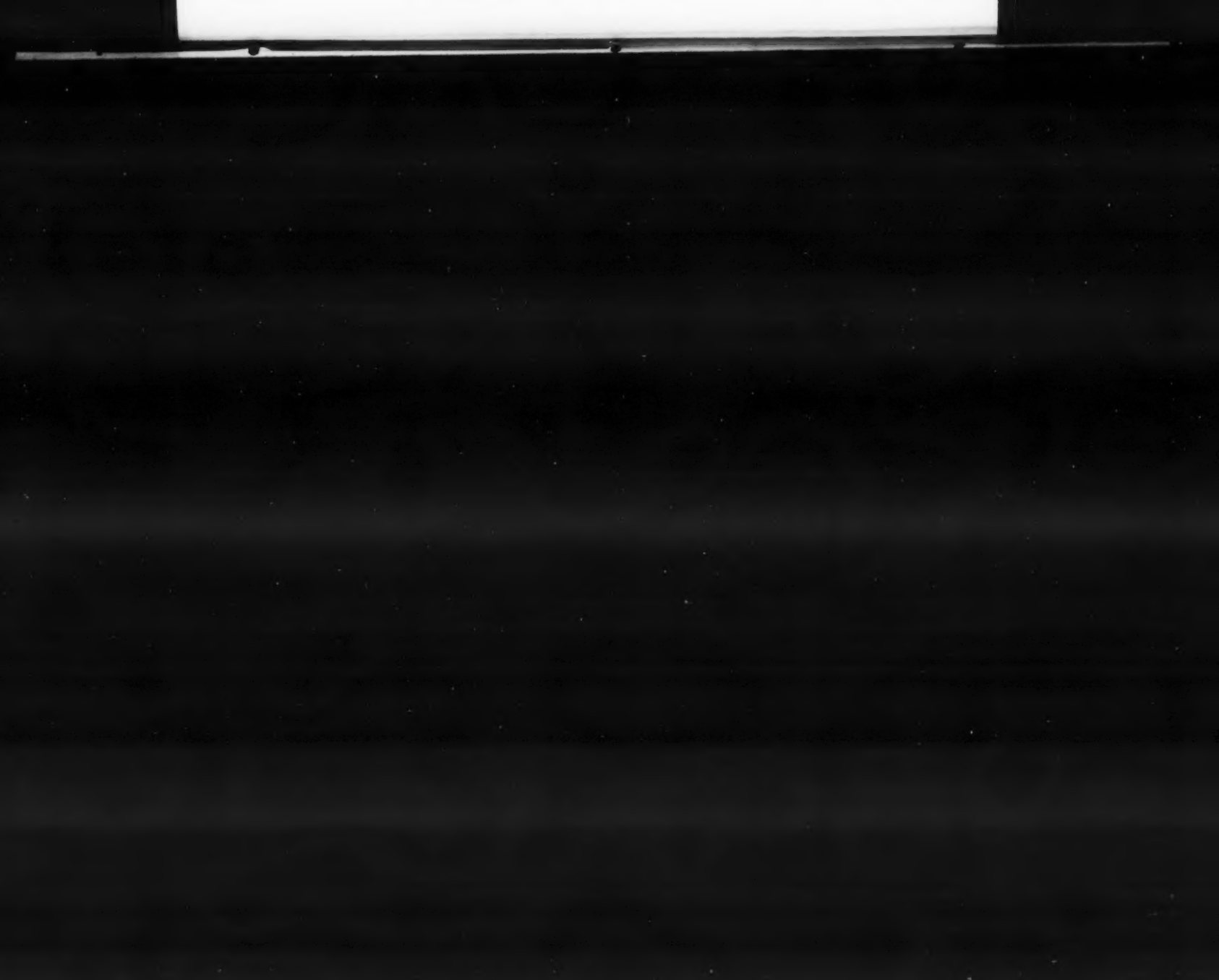
Emergency Landing

TO facilitate passenger and crew rescue as well as fire control in case an emergency landing becomes a crash landing, the following recommendation has been made:

When an emergency could or does exist and the airport crash crews have been asked to stand by, if time permits, the crew of the airplane should provide the tower with the following information:

- Number of persons on board, including crew.
- Quantity of fuel remaining.
- Any information that would help the crash crews form a better plan of action.

This information should also be given, time permitting, when coming in with one engine feathered even though the crash crew may have been asked to stand by.



approach

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JULY 1958 thru JUNE 1959

WELL DONE!

ENSIGN MEREDITH W. PATRICK, for your masterful handling of an emergency situation.

While attached to VA-44 undergoing A4D training, Ens. Patrick experienced a flameout in the NAS Jacksonville landing pattern. He extended his emergency generator and guided his aircraft away from the populated area, while zooming his excess airspeed into additional altitude. He then pulled the aircraft into a near stall over the St. Johns River so that it would fall into the river when he ejected. Three attempts to pull the curtain were ineffective. Ens. Patrick thereupon recovered from the stall and set up a course for ditching the aircraft in the river. He jettisoned his external stores and ditched successfully, but could not fire the canopy. He then actuated the manual canopy handle and the bungee fired the canopy free. Ens. Patrick vacated the aircraft and was picked up by helicopter very shortly. Commander, Carrier Air Group FOUR commended Ens. Patrick for his actions, said, ". . . reacted correctly to each of the emergency situations that confronted him . . . displayed exceptional skill in executing a stall recovery and ditching . . . his actions were thoroughly professional."

To Ens. M. W. Patrick, now attached to VA-172, APPROACH extends a hearty WELL DONE!